

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT				1. CONTRACT ID CODE <div style="text-align: center;">J</div>		PAGE OF PAGES <div style="text-align: center;">1   15</div>	
2. AMENDMENT/MODIFICATION NO. <div style="text-align: center;">0001</div>		3. EFFECTIVE DATE <div style="text-align: center;">09-Sep-2005</div>		4. REQUISITION/PURCHASE REQ. NO. W16ROE-5193-5896		5. PROJECT NO.(If applicable)	
6. ISSUED BY USA ENGINEER DISTRICT, NEW YORK ATTN:CENAN-CT ROOM 1843 26 FEDERAL PLAZA NEW YORK NY 10278		CODE W912DS		7. ADMINISTERED BY (If other than item 6) <div style="text-align: center; font-weight: bold;">See Item 6</div>		CODE	
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code)				X		9A. AMENDMENT OF SOLICITATION NO. W912DS-05-B-0019	
				X		9B. DATED (SEE ITEM 11) 19-Aug-2005	
						10A. MOD. OF CONTRACT/ORDER NO.	
						10B. DATED (SEE ITEM 13)	
CODE		FACILITY CODE					
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS							
<input checked="" type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer <input checked="" type="checkbox"/> is extended, <input type="checkbox"/> is not extended. Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing Items 8 and 15, and returning <u>1</u> copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.							
12. ACCOUNTING AND APPROPRIATION DATA (If required)							
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.							
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.							
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).							
C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:							
D. OTHER (Specify type of modification and authority)							
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input type="checkbox"/> is required to sign this document and return _____ copies to the issuing office.							
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) The purpose of this amendment is to make the following changes/clarifications to the solicitation Drawings and Specifications for the Brooklyn Union Gas (BUG) Site Salt Marsh Mitigation Project. Bid Opening Date is changed From: 19 September 2005 2:00 PM To: 20 September 2005 at 2:00 P.M.. See attached revised Bid Schedule.  All other terms and conditions remain the same.  Bidders must acknowledge receipt of this amendment by the date specified in the solicitation (or as amended) by one of the following methods: By signing Block 15 below, by separate letter, or by telegram. FAILURE TO ACKNOWLEDGE AMENDMENTS BY THE DATE AND TIME SPECIFIED MAY RESULT IN REJECTIONS OF YOUR BID IN ACCORDANCE WITH THE LATE BID, LATE MODIFICATION OF BIDS, OR LATE WITHDRAWAL OF BIDS (FAR 14.304).  Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.							
15A. NAME AND TITLE OF SIGNER (Type or print)				16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)			
				TEL: _____ EMAIL: _____			
15B. CONTRACTOR/OFFEROR  _____ (Signature of person authorized to sign)		15C. DATE SIGNED		16B. UNITED STATES OF AMERICA  BY _____ (Signature of Contracting Officer)		16C. DATE SIGNED  09-Sep-2005	

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

**SUMMARY OF CHANGES**

SECTION SF 30 - BLOCK 14 CONTINUATION PAGE

The following have been added by full text:

AMENDMENT 0001

**W912DS-05-B-0019**

**Amendment No. 1**

Bid opening date is changed to 20 September 2005 at 2:00 P.M.

The following changes shall be made to the specifications and plans.

**1) SPECIFICATIONS:**

-Section 00010: Revised Price/Bid schedule

-Replace Section 00800 with the revised text only, project signs are ok

-Section 00908: Added new section, boring logs new locations

-Replace Sections 01110N, 01320, 01330, 01551, 01552, 01553 with the attached revised. Sections

-Replace Section 02230, 02232, 02233, 02236, 02237, 02227, 02237, 02237, 02238, 02280 with the attached revised.

**2) DRAWINGS:**

-The following drawings, have been amended:

Plan sheets no.: 1, 2, 4, 6, and 12.

Section 00010 - Solicitation Contract Form

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0001	MOBILIZATION AND DEMOBILIZATION FFP MOBILIZATION AND DEMOBILIZATION PURCHASE REQUEST NUMBER: W16ROE-5193-5896	1	Lump Sum		
					<hr/>
NET AMT					

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0002	SITE CLEARING FOR STAGING AREA FFP SITE CLEARING FOR STAGING AREA	1	Lump Sum		
					<hr/>
NET AMT					

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0003	SOIL EROSION FFP SOIL EROSION				
					<hr/>
NET AMT					

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0003AA		1.27	Acre		
	SOIL EROSION AND SEDIMENT CONTROL				
	FFP				
	SOIL EROSION AND SEDIMENT CONTROL "Temporary Seed"				

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NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0003AB		100	Linear Foot		
	SOIL EROSION AND SEDIMENT CONTROL				
	FFP				
	SOIL EROSION AND SEDIMENT CONTROL "Sediment Traps"				

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NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0003AC		26,813	Square Yard		
	SOIL EROSION AND SEDIMENT CONTROL				
	FFP				
	SOIL EROSION AND SEDIMENT CONTROL "Erosion Control Blankets"				

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NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0004	WORK SITE FFP WORK SITE				

INFORMATION ONLY

NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0004AA	WORK SITE ACCESS AND EQUIP. STAGING AREA FFP WORK SITE ACCESS AND EQUIP. STAGING AREA "Const. Entrance and Equip. Staging Area"	2,422	Square Yard		

NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0004AB	WORK SITE ACCESS AND EQUIP. STAGING AREA FFP WORK SITE ACCESS AND EQUIP. STAGING AREA "Haul Roads"	6,267	Square Yard		

NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0005	CLEARING AND GRUBBING FFP CLEARING AND GRUBBING	1	Lump Sum		

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NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0006	SURVEYING FFP SURVEYING	1	Lump Sum		

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NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0007	EARTHWORK FFP EARTHWORK				

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INFORMATION ONLY

NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0007AA		37,225	Cubic Yard		
	EARTHWORK FFP EARTHWORK "Unclassified Excavation"				

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NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0007AB		7,225	Cubic Yard		
	EARTHWORK FFP EARTHWORK "Clean Sand-Imported"				

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NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0008		3,300	Linear Foot		
	SILT FENCE FFP SILT FENCE				

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NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0009	FLOATING TURBIDITY BARRIERS FFP FLOATING TURBIDITY BARRIERS	3,125	Linear Foot		

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NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0010	SEEDING FFP SEEDING				

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INFORMATION ONLY

NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0010AA	SEEDING FFP SEEDING "Permanent Seed Sp. and Mixtures"	5.79	Acre		

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NET AMT

FOB: Destination



ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0010AB	SEEDING FFP SEEDING "Permanent Seed Sp. and Mixtures - Installation"	1	Lump Sum		

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NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0010AC	SEEDING FFP SEEDING "Soil Amendments"	6,145	Square Yard		

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NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0010AD	SEEDING FFP SEEDING "Mulch"	6,145	Square Yard		

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NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0011	PLANT FFP PLANT				

INFORMATION ONLY

NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0011AA	PLANT MATERIAL AND MAINTENANCE FFP PLANT MATERIAL AND MAINTENANCE	113,970	Each	"Plant Material" 2" Plug "	

NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0011AB	PLANT MATERIAL AND MAINTENANCE FFP PLANT MATERIAL AND MAINTENANCE	1,005	Each	"Plant Material " 1-2 Gallon Container	

NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0011AC		195	Each		
	PLANT MATERIAL AND MAINTENANCE				
	FFP				
	PLANT MATERIAL AND MAINTENANCE		"Plant Material" 5-7 Gallon		
	Container				

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NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0011AD		1	Lump Sum		
	PLANT MATERIAL AND MAINTENANCE				
	FFP				
	PLANT MATERIAL AND MAINTENANCE		"Plant Material Installation"		

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NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0011AE		1,609	Square Yard		
	PLANT MATERIAL AND MAINTENANCE				
	FFP				
	PLANT MATERIAL AND MAINTENANCE		"Soil Amendments"		

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NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0011AF		1,609	Square Yard		
	PLANT MATERIAL AND MAINTENANCE				
	FFP				
	PLANT MATERIAL AND MAINTENANCE		"Mulch"		

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NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0011AG		5	Gallon		
	PLANT MATERIAL AND MAINTENANCE				
	FFP				
	PLANT MATERIAL AND MAINTENANCE		"Mycorriizhal Fungal Inoculum"		

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NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0011AH		1	Lump Sum		
	NOT USED				
	FFP				
	Do not price this clin (This clin was deleted in Amendment 0001)				

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NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0012		20,975	Linear Foot		
	WILDLIFE MANAGEMENT FFP WILDLIFE MANAGEMENT "Waterfowl Exclusion System"				

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NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0013					
	FENCING FFP FENCING				

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INFORMATION ONLY

NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0013AA		250	Linear Foot		
	FENCING FFP FENCING "Chain Link Fence"				

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NET AMT

FOB: Destination

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0013AB		300	Linear Foot		
	FENCING				
	FFP				
	FENCING "Construction Fence for Tree Protection"				

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NET AMT

**TOTAL BASE BID PRICE SCHEDULE: \$** \_\_\_\_\_

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0014 OPTION		1	Lump Sum		
	ADDITIONAL COST FOR OPTIONAL FFP				
	ADDITIONAL COST FOR OPTIONAL INSURANCE (the amount is the maximum that can be reimbursed, only actual expenses will be reimbursed)				

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NET AMT

**TOTAL BASE BID PLUS OPTIONAL ITEM: \$** \_\_\_\_\_

**NOTES FOR PRICE SCHEDULE:**

- 1 Bidders are required to bid on both the Base Bid Items and the Optional Items on the Price Schedule or their bid will be rejected.
- 2 The low bidder for the purpose of award will be the conforming responsible bidder offering the lowest amount for the Total Base Bid & Optional Items.
- 3 Any bid which is materially unbalanced as to the price for the Base Bid Item and Optional Item may be rejected. An unbalanced bid is one, which is based on price significantly less than the cost for some work and prices are significantly overstated for other work.
- 4 Bidders are reminded that they must bid on the issued plans and specifications as amended. Any deviations, conditions or attachments made by the bidders thereto may render the bid non-responsive and be cause for its rejection.

- 5 The Optional Item 0014, if awarded, may be awarded within 45 calendar days from issuance of the Notice to Proceed date. The Government is under no obligation to award any Optional Item. CLIN 0014; amount represents the maximum that the contractor shall be reimbursed after all the supporting documents are submitted, refer to Section 00800.

## **SECTION 00800**

### **SPECIAL CONTRACT REQUIREMENTS**

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4. PERFORMANCE OF WORK BY THE CONTRACTOR
5. CERTIFICATES OF COMPLIANCE
6. IMPLEMENTING GUARANTEES
7. BID GUARANTEE
8. CONTRACT DRAWINGS, MAPS AND SPECIFICATIONS
9. RECORD DRAWINGS
10. DESIGNATION OF PROPERTY ADMINISTRATOR
11. PHYSICAL DATA
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13. PAYMENT FOR MATERIALS DELIVERED OFF-SITE
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35. CONTRACTOR WORKING HOURS
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37. PROGRESS PAYMENTS
38. DAMAGE TO WORK
39. IDENTIFICATION OF DISPOSAL FACILITY
40. PERFORMANCE EVALUATION OF CONTRACTOR (1985 JAN HQ USACE)
41. CONTINUING CONTRACT (Alternate) (1995 MAR)(EFARS)
42. STATE/LOCAL INCOME TAXES



## SECTION 00800

### SPECIAL CONTRACT REQUIREMENTS

#### 1. COMMENCEMENT, EXECUTION AND COMPLETION OF WORK

a. The Contractor shall be required to (i) commence work under this contract within 5 calendar days after the date the Contractor receives the Notice to Proceed, (ii) execute the work diligently, and (iii) complete work in the ready for use, not later than 260 calendar days after the date the Contractor receives the notice to proceed. The time stated for completion shall include final cleanup of the premises.

b. Location: The site of work is located along the eastern bank of Old Place Creek west of the Keyspan Energy Facility on Gulf Avenue, Richmond County, Staten Island, NY.

c. The Contractor shall furnish all labor, materials, equipment and services for the following work: Temporary facilities and controls installation, Soil erosion and sediment control, clearing, grubbing, excavation, disposal, planting, seeding and maintenance of a 5.4 acre planned tidal wetland and associated 1.27 acre maritime upland transition area.

d. All work shall be in completed in accordance with the drawings and specifications or instructions attached hereto and made a part thereof, or to be furnished hereafter by the Contracting Officer and subject in every detail to his supervision, direction, and instructions. (DoD FAR Supplement 52.236-7014)

e. Magnitude of Construction Project: The estimated value of the work is between \$1,000,000 and \$5,000,000.

#### f. ADDITIONAL CONTRACTOR REQUIREMENTS

All references will be contacted and the government will be conducting an extensive pre-award survey during the pre-award period.

1-The successful bidder must have the necessary organization, experience, accounting and operational controls, and technical skills, or the ability to obtain them. One factor the government will use in determining whether the apparent low bidder meets this requirement is whether it has successful use the following specialized field equipment for a minimum of three marsh restoration projects:

marsh excavator  
marsh mats

The contractor shall provide within three (3) days of bid opening 5 copies of all references and contacts for a minimum three (3) similar projects completed within the last five years with a minimum value of \$3,000,000 each demonstrating the experience indicated below:

#### **2-Supervisor (Wetland Environmental Specialist)**

The Contractor shall employ a supervisor (Wetland Environmental Specialist), for QA/QC purposes, with a background in plant and soils sciences who has provided construction oversight for a minimum of three

wetland restoration/creation projects that are greater than or equal to 5 acres in size, with the following complexities:

- tidal creek crossings
- unconsolidated substrate and highly organic soils
- variable salinity regimes
- invasive plants,
- herbivory

### **3- Project Manager**

The Contractor shall employ a **Project Manager** with a minimum of 5 years of experience in the design, preparation of plans and specifications, and construction oversight of a minimum of three tidal marsh restoration or creation projects, 5 acres in size or larger, with the following complexities:

- tidal creek crossings,
- unconsolidated substrate and highly organic soils

Information to be provided to include:

- the project title, -project location,
- body of water in which the project is located, -owner,
- point of contact with current phone number, fax number, e-mail address (if available), and street address.
- Also indicate for each project the initial contract amount, initial contract completion date, contract value at completion, and final completion date.
- Projects shall be of a relevant size, scope and complexity to this Project. Comments relating to the projects may be provided.

## **2. LIQUIDATED DAMAGES - CONSTRUCTION (APR 1984)**

a. If the Contractor fails to complete the work within the time specified in the Contract, or any extension, the Contractor shall be subject to daily liquidation damages payable to the Government as the sum of \$1,285 for each day of delay.

b. If the Government terminates the Contractor's right to proceed, the resulting damage will consist of liquidated damages until such reasonable time as may be required for final completion of the work together with any increased costs occasioned the Government in completing the work.

c. If the Government does not terminate the Contractor's right to proceed, the resulting damage will consist of liquidated damages until the work is completed or accepted. (FAR 52.212-5)

d. At a time before the project is physically complete but is functionally complete to the satisfaction of the Government, the Government at its sole discretion may agree to accept transfer of the facility or project provided that the remaining work to be done ("punchlist") is completed no later than 30 days from the date of transfer. In this case the Contractor shall pay liquidated damages for punchlist items not completed in the daily amount of \$100 per day commencing after 30 days of project transfer or after date required for project completion (including all extensions), whichever occurs later.

## **3. EQUAL OPPORTUNITY PREAWARD CLEARANCE OF SUBCONTRACTS (1984 APR) (FAR 52.222-28)**

Notwithstanding the clause of this contract entitled "Subcontracts" the Contractor shall enter into a first-tier subcontract for an estimated or actual amount of \$1 million or more without obtaining in writing

from the Contracting Officer a clearance that the subcontractor is in compliance with the equal opportunity requirements and therefore is eligible for award.

#### 4. PERFORMANCE OF WORK BY THE CONTRACTOR (1984 APR)

The Contractor shall perform on the site, and with its own organization, work equivalent to at least twenty (20) percent of the total amount of work to be performed under the contract. This percentage may be reduced by supplemental agreement to this contract if, during performing the work, the Contractor requests a reduction and the Contracting Officer determines that the reduction would be to the advantage of the Government. (FAR 52.236-1)

#### 5. CERTIFICATES OF COMPLIANCE

Any Certificates required for demonstrating proof of compliance of materials with specification requirements shall be executed in 4 copies. Each certificate shall be signed by an official authorized to certify on behalf of the manufacturing company and shall contain the name and address of the Contractor, the project name and location, and the quantity and date or dates of shipment or delivery to which the certificates apply. Copies of laboratory test reports submitted with certificates shall contain the name and address of the testing laboratory and the date or dates of the tests to which the report applies. Certification shall not be construed as relieving the Contractor from furnishing satisfactory material, if, after tests are performed on selected samples, the material is found not to meet the specific requirements. (ECI 7- 670.3)

#### 6. IMPLEMENTING GUARANTEES

At any time subsequent to the acceptance by the Government of a completed installation or project site under this contract, which installation or project site is required to be covered by a specific guarantee under the terms of the various sections in the TECHNICAL PROVISIONS, the contracting officer will be an authorized party for the purpose of implementing the provisions of such guarantees in behalf of the Government.

#### 7. BID GUARANTEE

See Bid Guarantee Clause of Section 00700, CONTRACT CLAUSES.

#### 8. CONTRACT DRAWINGS, MAPS AND SPECIFICATIONS

See contract clause entitled CONTRACTOR DRAWINGS, MAPS AND SPECIFICATIONS in Section 00700 CONTRACT CLAUSES. For a listing of Contract Drawings refer to the "Cover Sheet" on drawing CV-1.

#### 9. RECORD DRAWINGS (R.6-01)

a. General: The Contractor shall produce a set of as-built drawings upon completion of rough excavation and an additional set upon completion of rough grading. Final record drawings shall be

submitted at the completion of grading and planting. The Government will provide to the Contractor the CAD (Computer-Aided Drafting) files consisting of compact (computer) disks or magnetic media of the drawing files in the appropriate CAD format (i.e. "Microstation") for the project. The Contractor is required to make prints or mylars from the CAD files and continuously maintain drawings at the work site to show current as-built conditions for the duration of the construction. Except for updates as indicated below, the Contractor may maintain as-built drawings by marking up drawings by hand or by CAD methods. Scanned drawings will not be acceptable. If the Government cannot provide CAD files for the project drawings, mylar (reproducible) drawings will be provided. The Contractor shall then be required to comply with all requirements indicated herein by the use of hand drafting.

b. Progress As-built Prints: During construction the Contractor is responsible for maintaining an up to date paper set of prints to show as-built construction conditions. These prints shall be kept current and available on the job site at all times. All changes from the contract plans which are made in the work or additional information which might be uncovered in the course of construction shall be accordingly and neatly recorded as they occur by means of details and notes. The as-built prints will be jointly inspected for accuracy and completeness by the Contracting Officer's Representative and a responsible representative of the Contractor prior to submission of each monthly pay estimate. Progress as-builts shall show the following information, but not limited thereto:

(1) The location and description of any utility lines, valves, stormwater facilities/outfalls or other installations of any kind within the construction area. The location includes dimensions to permanent features. Average depth below surface shall also be indicated.

(2) Correct grade or alignment of roads, structures or utilities if any changes were made from the contract plans.

(3) Correct elevations if changes were made in site grading

(4) Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor including but not limited to fabricated, erection, installation plans and placing details, pipe sizes, insulation material, dimensions of equipment foundations, etc.

(5) The topography and grades of all drainage installed or affected as part of the project construction.

(6) All changes, which result from contract modifications.

(7) Where contract drawings or specifications allow options, only the option selected for construction shall be shown on the as-built prints.

(8) Systems designed or enhanced by the Contractor, such as HVAC controls, fire alarm, fire sprinkler or irrigation systems.

(9) All amendments to the contract drawings issued during the solicitation period shall be posted on the as-built drawings.

c. Hand Drafting: If mylars only are provided to the Contractor, they shall be updated using hand drafting. Only personnel proficient in the preparation of engineering drawings to standards satisfactory and acceptable to the Government shall be employed to modify the mylar reproduction drawings or prepare additional new drawings. All additions and corrections to the contract drawings shall be neat, clean and legible, and shall match the adjacent line work and/or lettering being annotated in type, density,

size and style. All drafting work shall be done using the same medium (pencil, plastic lead or ink) that was employed on the original contract drawings and with graphic lead on paper base material. The title block to be used for any new as-built drawings shall be similar to that used on the original contract drawings.

d. **Protection of Records:** The Contractor shall be responsible for the protection and safety of mylars and CAD record until returned to the Contracting Officer. Any drawings damaged or lost by the Contractor shall be satisfactorily replaced by the Contractor at his expense.

e. **50% As-Built Update:** At the 50% point in construction of this project (as determined by progress payments) the Contractor will update the CAD files of the project drawings in the appropriate CAD program to show as-built conditions as above, and submit an updated computer disk and one set of prints to the Contracting Officer for approval. If mylars only are provided to the Contractor, they shall be updated at this stage using hand-drafting as specified herein, and the Contractor shall submit one set of prints to the Contracting Officer for approval. Any required corrections shall be made by the Contractor before payment will be approved for this item. The Contractor must use the updated CAD record or mylar drawings to produce required prints.

f. **Preliminary Record Drawing Submittal:** At least fifteen calendar (15) days before the anticipated date of final acceptance inspection the Contractor shall deliver two copies of progress prints showing final as-built conditions to the Contracting Officer for review and approval. These prints shall correctly show all the features of the project as it has been constructed, adding such additional drawings as may be necessary. They shall be printed from the CAD files updated in the appropriate CAD program, or from updated mylars if mylars only were provided to the Contractor. Within ten (10) days, the Government will provide the Contractor one set of prints indicating required corrections to the preliminary submittal. Contractor shall correct and resubmit within five (5) days. Any required subsequent review and resubmission periods will each be accomplished within five (5) days. Upon Government approval of the preliminary submittal, the Contractor shall prepare final record drawings.

g. **Record Drawing Submission:** In the appropriate CAD program each drawing shall be marked with the words "RECORD DRAWING AS-BUILT" followed by the name of the Contractor in a font, which will print at least 3/16" high. All revisions to the original contract drawings will be dated in the revision block. All prints and mylars must be reproduced from the updated CAD files. If mylars only were provided to the Contractor, they shall be hand-lettered or stamped as indicated above, and revisions shown in revision block. A minimum of 5 calendar days before the anticipated date of final acceptance inspection of the project the Contractor shall deliver to the Contracting Officer:

- Three (3) CD's (ROM) of CAD files of Record Drawings.
- One (1) set of Mylar Record Drawings
- One (1) copy of prints of Record Drawings.

Failure to make an acceptable submission of Record Drawings will delay the Final Acceptance Inspection for the project and shall be cause for withholding any payment due the Contractor under this contract.

h. **Property:** All paper prints, reproducible drawings and CAD files will become property of the Government upon final approval. Approval and acceptance of the final record drawings shall be accomplished before final payment is made to the Contractor.

i. **Payment:** No separate payment will be made for the as-built and record drawings or updating of CAD files required under this contract, and all costs in connection therewith shall be considered a subsidiary obligation of the Contractor.

## 10. DESIGNATION OF PROPERTY ADMINISTRATOR

Not Used

## 11. PHYSICAL DATA

Information and data furnished or referred to below are not intended representations or warranties but are furnished for information only. It is expressly understood that the Government will not be responsible for any deduction, interpretation, or conclusion drawn therefrom by the Contractor: (FAR 52.236-4) (APR 1984).

a. Weather Conditions: Climatological data determined from records of the U.S. Weather Service Bureau at Newark Airport, N.J.:

Mean Annual Temperature: 54.1 degrees F

Mean Annual Precipitation: 43.0 inches

See paragraph entitled TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER.

b. Transportation Facilities:

(1) Highways and Roads: Gulf Avenue serves the locality of the work in Northwestern Staten Island. Gulf Avenue is accessible from the Staten Island Expressway (east or west). Curb cuts and construction entrances from Gulf Avenue to the work area to be constructed and/or used by the Contractor, shall be subject to prior approval by the Contracting Officer. Such entrances or curb cuts if constructed and/or used, shall be maintained throughout construction and shall be restored to their pre-construction condition upon completion of work. All curb cut permits, if required, shall be the responsibility of the Contractor. The Contractor shall also construct such temporary haul roads and bridges as may be necessary for the conduct of his work. Any such temporary construction shall be restored to its original condition prior to achieving finish grades and planting. All costs for the use of existing transportation facilities, for the construction of temporary facilities, and for maintenance, repair, removal and restoration shall be borne by the Contractor.

## 12. PRICING OF ADJUSTMENTS

When costs are a factor in any determination of a contract price adjustment pursuant to the Changes clause or any other clause of this contract, such costs shall be in accordance with Part 31 of the Federal Acquisition Regulation and DFARS 52.215-7000 (APR 1985) as follows: In determining whether a pricing adjustment is expected to exceed \$100,000, the term "pricing adjustment" shall mean "the aggregate increases and /or decreases in cost plus applicable profits."

## 13. PAYMENT FOR MATERIALS DELIVERED OFF-SITE

Pursuant to the Contract Clauses in this contract titled "Payments Under Fixed-Price Construction Contracts", materials delivered to the Contractor at locations other than the site of the work may be taken into consideration in making payments if included in payment estimates and if all the conditions of the Contract Clauses are fulfilled. Payment for items delivered to locations other than the work site will be

limited to those materials, which have been approved, if required by the technical provisions; those materials which have been fabricated to the point where they are identifiable to an item of work required under this contract. Such payment will be made only after receipt of paid or receipted invoices or invoices with cancelled check showing title to the items in the prime contractor and including the value of materials and labor incorporated into the item. (EFARS 52.2/9102E)

#### 14. EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE (EFARS 52.2/9108 (f))

a. Allowable cost for construction and equipment in sound workable condition owned or controlled and furnished by a Contractor or Sub-contractors at any tier shall be based on actual cost data when the Government can determine both ownership and operating costs for each piece of equipment or equipment groups of similar serial and series from the Contractor's accounting records. When both ownership and operating costs cannot be determined from the Contractor's accounting records, equipment costs shall be based upon the applicable provisions of EP 1110-1-8, "Construction Equipment Ownership and Operating Expense Schedule," Region 1. Working conditions shall be considered to be average for determining equipment rates using the schedule unless specified otherwise by the Contracting Officer. For equipment not included in the schedule, rates for comparable pieces of equipment may be used or a rate may be developed using the formula provided in the schedule. For forward pricing, the schedule in effect at the time of negotiation shall apply. For retrospective pricing, the schedule in effect at the time the work was performed shall apply.

(\* This manual can be ordered from the Government Printing office by calling telephone number (202) 783-3238. There is a charge for the manual.)

b. Equipment rental costs are allowable, subject to the provisions of FAR 31.105(d)(ii) and FAR 31.205-36 substantiated by certified copies of paid invoices. Rates for equipment rented from an organization under common control, lease-purchase or sale-leaseback arrangements will be determined using the schedule except that rental costs leased from an organization under common control that has an established practice of leasing the same or similar equipment to unaffiliated lessees are allowable. Costs for major repairs and overhaul are unallowable.

c. When actual equipment costs are proposed and the total amount of the pricing action is over \$25,000, cost or pricing data shall be submitted on Standard Form 1411, "Contract Pricing Proposal Cover Sheet." By submitting cost or pricing data, the Contractor grants to the Contracting Officer or an authorizing representative the right to examine those books, records, documents and other supporting data that will permit evaluation of the proposed equipment costs. After price agreement the Contractor shall certify that the equipment costs or pricing data submitted are accurate, complete and current.

#### 15. ALTERATIONS IN CONTRACT (APR 1984)

Not Used

#### 16. AVAILABILITY AND USE OF UTILITY SERVICES AND PERMITS (APR 1984)

a. The Contractor shall, at its expense and in a workman-like manner satisfactory to the Contracting Officer, install and maintain all necessary temporary connections and distribution lines, and all meters where required. The Contractor shall furnish to the Contracting Officer a complete system layout drawing showing type of materials to be used and method of installation for all temporary electrical systems. Telephone service is the responsibility of the Contractor. The Contractor shall maintain all

temporary lines in a workman-like manner satisfactory to the Contracting Officer. Before final acceptance of the work by the Government, the Contractor shall remove all temporary connections, distribution lines, meters and associated paraphernalia.(FAR 52.235-14)

b. Utility Service Interruptions. The Contractor shall submit written notification not less than fifteen (15) calendar days in advance of each interruption of each utility and communication service to or within existing buildings and facilities being used by others. No single outage will exceed 4 hours unless approved in writing. The time and duration of all outages will be coordinated with the Using Agency by the Contracting Officer Representative. All outages or interruptions shall be scheduled during weekends, unless specifically approved by the Contracting Officer's Representative.

c. Digging Permits and Road Closings. No excavation whether minor or major including trenching, sidewalk Replacement, etc. will be permitted without an approved permit. No road closure will be permitted without an approved permit. The Contractor shall allow fifteen (15) calendar days from date of written application to receive permission to dig and to close roads.

The Contractor shall ascertain the name of the agencies and/or individual(s) to submit the application or applications from the Government's representative. The Contractor shall carefully avoid contact or damage with any known or identified underground utilities. Roads shall only be closed one lane at a time, and vehicular traffic shall be allowed to pass through the construction area. Work on or near roadways shall be flagged in accordance with the safety requirements in Safety and Health Requirements Manual EM 385-1-1, which forms a part of these specifications and shall also be in conformance with New York City and where applicable New York State Department of Transportation standards. The Contractor shall apply for the renewal of work permits as required if the work continues beyond the original permit expiration date.

d. Metal Burning and Welding and Access to Confined Spaces. Permits for such work shall be obtained in advance as required by the operator of the facility. Contractor shall coordinate through the Government Representative for such permits.

## 17. CONSTRUCTION PROJECT SIGNS

The Contractor shall construct five (5) signs; four (4) for project identification and the other to show on-the-job safety performance. One of these signs shall contain the pertinent New York State Department of Environmental Conservation (NYSDEC) permit information contained under line a (1) below.

a. These signs shall be placed at the Contracting Officer's direction within fifteen (15) calendar days after the Contractor receives the initial Notice to Proceed.

(1) One of the four (4) signs shall contain the following information as required by the NYSDEC:

This work is authorized under NYSDEC Permit No. 2-6499-00001/000002

Facility/Program Number:

USACE Arthur Kill 40'/41' Deepening Mitigation Project

b. Exact placement location will be designated by the Contracting Officer.

c. Panels are fabricated using HDO (High Density Overlay) plywood with dimensional lumber uprights and bracing. The sign faces are non-reflective vinyl.



d. All legends are to be die-cut or computer-cut in the sizes and type-faces specified and applied to the white panel background following the graphic formats shown on the attached sheets. The Communications Red panel on the left side of the construction project sign with Corps signature (reverse version) is screen printed onto the white background.

e. The project names on the sample signs are only provided to illustrate format. The actual signs will include the name of this project. Samples are included herein at the end of this section.

f. No separate payment will be made for erecting and maintaining the signs and all costs in connection therewith will be considered the obligation of the Contractor. Upon completion of the project, the Contractor shall remove the signs from the project site.

#### 18. LABOR SURPLUS AREA EXPENDITURE REQUIREMENTS (JUL 1978)

a. The site of the construction work is located in an area determined by the Secretary of Labor to be a Labor surplus Area. Accordingly the Contractor hereby agrees to perform a substantial portion of the contract work in this or in any other labor surplus area. "Substantial portion" means the aggregate costs that will be incurred by the Contractor and his first-tier subcontractors and suppliers, on account of manufacturing, production, or services performed in this or any labor surplus area, and the costs that will be incurred by second-tier and lower-tier subcontractors on the construction site will exceed fifty percent (50%) of the price of this contract.

b. Upon request, the Contractor shall furnish to the Contracting Officer data to substantiate that this obligation is satisfied.

c. The Contracting Officer will furnish upon request a list of labor surplus areas.

#### 19. TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER

1. This provision specifies the procedure for determination of time extension for usually severe weather in accordance with the contract clause entitled "Default: (Fixed Price Construction)." Requests for time extensions based on the timing or duration of normal diurnal tides shall not represent a valid basis for extensions. In order for the Contracting Officer to award a time extension under this clause, the following conditions must be satisfied:

a. The weather experienced at the project site during the contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month.

b. The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the Contractor.

2. The following schedule of monthly anticipated adverse weather delays is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the base line for monthly weather time evaluations. The Contractor's progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities.

#### MONTHLY ANTICIPATED ADVERSE WEATHER DELAY WORK DAYS BASED ON (5) DAY WORK WEEK

JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

(8) (7) (8) (9) (9) (8) (6) (7) (5) (8) (7) (9)

3. Upon acknowledgment of the Notice to Proceed (NTP) and continuing throughout the contract, the Contractor shall record on the daily CQC report, the occurrence of adverse weather and resultant impact to normally scheduled work. Actual adverse weather delay days must prevent work on critical activities for 50 percent or more of the Contractor's scheduled workday. The number of actual adverse weather delay days shall include days impacted by actual adverse weather (even if adverse weather occurred in previous month), be calculated chronologically from the first to the last day of each month, and be recorded as full days. If the number of actual adverse weather delay days exceeds the number of days anticipated in paragraph 2 above, the Contracting Officer will convert any qualifying delays to calendar days, giving full consideration for equivalent fair weather work days, and issue a modification in accordance with the contract clause entitled "Default (Fixed Price Construction)". (ER 415-1-5) (31 Oct 89)

## 20. SCHEDULING AND DETERMINATION OF PROGRESS

Pursuant to the contract clause, SCHEDULES FOR CONSTRUCTION CONTRACTS, the Contractor shall prepare and submit for approval a practicable project schedule. The type of schedule and detailed requirements as well as timing of this submittal shall be as specified in specification section 'PROJECT SCHEDULE'.

This schedule will be the medium through which the timeliness of the Contractor's construction effort is appraised. When changes are authorized that result in contract time extensions, Contractor shall submit a modified schedule for approval by the Contracting Officer.

The terms of Contract Clause, SCHEDULING FOR CONSTRUCTION CONTRACTS, with reference to overtime, extra shifts, etc., may be invoked when the Contractor fails to start or complete work features or portions of same by the time indicated by the milestones dates on the approved project schedule, or when it is apparent to the Contracting Officer from the Contractor's actual progress that these dates will not be met.

Neither on the project schedule as originally submitted nor on any updated periodic schedules which the Contractor is required to prepare and submit, shall be actual progress to be entered include or reflect any materials which even though on the site, are not yet installed or incorporated in the work. For payment purposes only, an allowance will be made by the Contracting Officer of up to 100 percent of the invoiced cost of materials or equipment delivered to the site but not incorporated into the construction, pursuant to Contract Clause, PAYMENT UNDER FIXED-PRICE CONSTRUCTION CONTRACTS. The making of such an allowance will be contingent upon a determination by the Contracting Officer that the Contractor's compliance with the quality control requirements of the contract is more than satisfactory.

## 21. IDENTIFICATION OF EMPLOYEES

The Contractor shall be responsible for furnishing to each employee and for requiring each employee engaged on the work to display such identification as may be approved and directed by the Contracting Officer. All prescribed identification shall immediately be delivered to the Contracting Officer for cancellation upon the release of any employees. When required by the Contracting Officer, the

Contractor shall obtain and submit finger-prints of all persons employed or to be employed on the project. (DOD FAR Supplement 52.236-7007)

## 22. FIELD OFFICE

a. The Contractor shall furnish at the job site, prior to the start of work, a 20 feet by 15 feet field office for the use by the Government representatives for the duration of the contract. Field office and contents remain the property of the Contractor. The exact location will be designated by the Contracting Officer. The structure shall be well constructed and properly ventilated and shall contain a closet and door and windows which shall be capable of being locked, four (4) new ergonomically-designed chairs, one (1) plan rack and drawing board, two (2) desks, and one (1) two-drawer filing cabinet. The Contractor shall also provide adequate electric lighting, minimum 6 duplex electrical receptacles, drinking water, heat, plumbed functional toilet facilities, air conditioning, janitorial services and maintenance services. In addition the contractor shall make arrangements and pay connection fees and monthly usage for electrical and 3-line telephone service (fax, modem and voice). The field office shall be removed from the project site when and as directed by the Contracting Officer. In addition to the above, the Contractor shall provide the following computer and office equipment, and other items for use by the Government during the contract:

Hardware:

Personal Computer:

- Pentium IV processor running at 1.8 GHz or better
- High-speed cache memory controller with at least 512 KB L2 PIPELINE BURST CACHE
- At least 512MB SDRAM
- 400MHz System Bus
- (1) 3.5" 1.44 MB diskette drives with hard drive controller
- Hard drive controller with 40 GB hard drive with access time of 9 ms
- Sound Card WITH SPEAKERS
- Enhanced 101 keyboard
- 6-outlet surge protector
- 17" Flat Panel SVGA high resolution COLOR monitor or better with a refresh rate of 75Hz or better and 8Mb Color Graphics
- 3 Button ergonomic mouse and mouse pad
- Modem V.90 or V.92 56KB Baud (U.S. Robotics or equal)
- Internal DVD ROM 16X and CD-RW (Read/Write) Drive 24X
- Microsoft Windows 2000 Professional Operating System
- Microsoft Office 2000 Professional Suite
- Lotus Smart Suite and Adobe Acrobat Reader
- Signature card reader: Gradkell Computer Inc.

Part# 050-0300 Description: Argus 300 (card reader and PCI adapter package) for CEFMS: phone# (256)-722-8585 X37 (Mr. Wayne Wright)

Norton Antivirus Software 2002 and periodic updates.

Printer:

Hewlett Packard Laserjet 4100 Series Printer or equivalent Laserjet Printer.

Digital Camera: Kodak DC260 or equal with carrying case and supporting software, capable of running on the Contractor-supplied personal computer.

Copier: Plain-paper, desktop, autofeed, monochrome, minimum 10 copies per minute.

Fax Machine: Monochrome, minimum feed (3) - 8 1/2x11 inch pages per minute. Capable of receiving on plain white bond paper.

Telephone: 2-Line phone compatible with phone service.

Telephone Answering Machine: Standard, compatible with standard telephone line and local service.

First Aid Kit: As a minimum the kit will include antiseptic kit, eyewash solution, bandages, insect sting medication, aspirin and acetaminophen, and cold pack.

Fire Extinguisher: Type as required for a trailer the same size as office.

b. The Contractor, at its option, may furnish a trailer not less than 20 feet long. The trailer shall be approved by the Contracting Officer and shall have the facilities and be serviced as specified above for the field office.

c. No separate payment will be made for providing the above items and all costs in connection therewith will be considered the obligation of the Contractor.

Computer Security requirements:

The contractor shall agree to accept responsibilities and comply with procedures indicated below in connection with the furnishing of Contractor- owned computers for use by Government personnel in accordance with contract requirements.

a. The computers must be dedicated exclusively for Government use. Contractor shall not use any computer it supplies which is designated for use by the Government. Contractor shall assure that the Central Processing Unit (CPU) is electronically isolated from the contractor's and not inter-connected via Local Area Network (LAN).

b. Normal access to the computer shall be restricted to Corps of Engineers personnel. Contractor shall set up computers in a secure area and give the keys to the Government. Contractors must immediately notify Government personnel when emergency access to the computer location was exercised by non-Government individuals, and what the circumstances were.

c. If the CPU hard drive fails, the Government will furnish an equivalent hard drive to the owner of the computer, and the old hard-drive will be returned to the Government. Contractor shall not remove any hard drive nor proceed with any repair of the computer unless an authorized Government employee witnesses and approves of the repair.

d. At the time of return of the computer, the Contractor shall allow the Government to first remove all information from the hard-drive.

e. Contractor agrees to provide a written certification signed by an authorized officer of the company agreeing to the above policy.

## 23. QUANTITY SURVEYS (APR 1984)

a. Quantity surveys shall be conducted, and the data derived from these surveys shall be used in computing the quantities of work performed and the actual construction completed and in place.

b. The Contractor shall conduct the original and final surveys and surveys for any periods for which progress payments are requested. All these surveys shall be conducted under the direction of a representative of the Contracting Officer, unless the Contracting Officer waives this requirement in a specific instance. The Government shall make such computations as are necessary to determine the quantities of work performed or finally in place. The Contractor shall make the computations based on the surveys for any periods for which progress payments are requested.

c. Promptly upon completion of a survey, the Contractor shall furnish the originals of all field notes and all other records relating to the survey or to the layout of the work to the Contracting Officer, who shall use them as necessary to determine the amount of progress payments. The Contractor shall retain copies of all such material furnished to the Contracting Officer. (FAR 52.236-16)

#### 24. MISPLACED MATERIAL

Should the Contractor, during the progress of the work, lose, dump, throw, or misplace any material, plant, machinery, or appliance, which in the opinion of the Contracting Officer may be dangerous to site and people, the Contractor shall recover and remove the same with the utmost dispatch. The Contractor shall give immediate notice, with description and location of such obstructions, to the Contracting Officer or inspector, and when required shall mark the obstructions until the same are removed. Should he refuse, neglect, or delay compliance with the above requirements, such obstructions may be removed by the Contracting Officer, and the cost of such removal may be deducted from any money due or to become due the Contractor, or may be recovered under his bond. The liability of the Contractor for the removal of material without fault or negligence shall be limited to that provided in the DOD FAR

#### 25. SUPERINTENDENCE OF SUBCONTRACTORS (JAN 1965)

a. The Contractor shall be required to furnish the following, in addition to the superintendence required by the Contract Clause titled, 'SUPERINTENDENCE BY THE CONTRACTOR.'

(1) If more than 50% and less than 70% of the value of the contract work is subcontracted, one superintendent shall be provided at the site and on the Contractor's payroll to be responsible for coordinating, directing, inspecting and expediting the subcontract work.

(2) If 70% or more of the value of the work is subcontracted, the Contractor shall be required to furnish two such superintendents to be responsible for coordinating, directing, inspecting and expediting the subcontract work.

b. If the Contracting Officer, at any time after 50% of the subcontracted work has been completed, finds that satisfactory requirement is being made, he may waive all or part of the above requirement for additional superintendence subject to the right of the Contracting Officer to reinstate such requirement if at any time during the progress of the remaining work he finds that satisfactory progress is not being made. (DOD FAR Supplement 52.236-7008)

#### 26. PROCEDURES FOR SUBMISSION AND PAYMENT OF ALL CONTRACT PAYMENTS

In addition to the requirements contained in the Contract Clause entitled "PAYMENTS UNDER FIXED-PRICE CONSTRUCTION CONTRACTS" and to implement the requirements of the Prompt Payment Act Amendments of 1988, P.L. 100-496, the following shall apply to all payments made under this contract:

a. At the time of submission of the progress chart, the Contractor shall submit for approval by the Contracting officer or his authorized representative a breakdown of the contract work, which shall be to the degree of detail required by the Contracting Officer, or his representative, to effect reasonable progress payments. The Contracting Officer, or his representative, shall review this breakdown within 30 calendar days after receipt and either advise the Contractor that it is approved or disapproved, and if disapproved the reasons for disapproval. Only after the breakdown is approved shall any payment invoice be accepted from the Contractor and any payment made to him. The Contracting Officer can determine if it is in the best interest of the Government to make payment without an approved breakdown; however, in no case shall more than 10% of the contract amount be paid unless the breakdown is approved.

b. The Contractor shall submit his request for payment by submission of a proper invoice to the office or person(s) designated in subparagraph c. For purposes of payment a "proper invoice" is defined as the following:

(1) An estimate of the work completed in accordance with the approved breakdown indicating the percentage of work of each item and the associated costs.

(2) A properly completed Engineering Form 93 and 93a (where required).

(3) All contractual submissions indicated elsewhere in this contract to be submitted with payment, such as updated progress schedules, updated submittal registers, etc.

(4) The following certification executed by a responsible official of the organization authorized to bind the firm. A "responsible official" would be a corporate officer, partner, or owner, in the case of a sole proprietorship.

I hereby certify, to the best of my knowledge and belief, that -

(a) The amounts requested are only for performance in accordance with the specifications, terms and conditions of the contract;

(b) Payments to subcontractors and suppliers have been made from previous payments received under the contract and timely payments will be made from the proceeds of the payment covered by this certification, in accordance with subcontract requirements and the requirements of Chapter 39 of Title 31, United States Code; and

(c) This request for progress payments does not include any amounts, which the prime Contractor intends to withhold or retain from a subcontractor or supplier in accordance with the terms and conditions of the subcontract.

(d) All required prime and subcontractor payrolls have been submitted.

(Name)

(Title)

(Date)

c. The Government shall designate the office or person(s) who shall first receive the invoice submissions and the Contractor shall be so notified at the pre-construction conference. In addition to the designated Project Engineer, the Contractor shall at the same time submit one copy of the detailed breakdown and the Eng Form 93 and 93a Form to the Area Engineer.

d. The Government representative shall return any request for payment which is deemed defective within 7 days of receipt and shall specify the defects. If the defect concerns a disagreement as to the amount of work performed and or the amount of the payment being submitted, the Government and the Contractor's representative should meet to resolve the difference and reach agreement. Upon agreement, the Contractor shall submit a new breakdown and Eng Form 93 (and 93a) and any other submissions requiring correction. These will be incorporated with the previous submittal and will then constitute a proper invoice.

e. If agreement cannot be reached, the Government shall determine the proper amount per Contract Clause, PAYMENTS UNDER FIXED-PRICE CONSTRUCTION CONTRACTS and process the payment accordingly. In this event, a "proper invoice" for Prompt Payment Act purposes will not have been submitted to the Government.

f. The Government shall pay the Contractor in accordance with the following time frames:

(1) Progress Payments. From the date a "proper invoice" is received, in accordance with subparagraphs b and d of this clause, the Government will issue a check with fourteen (14) calendar days.

(2) Reduction in Retainage Payment. If during the course of the contract, a reduction in retainage payment is required, the Government shall issue a check within fourteen (14) calendar days after the approval of the release to the Contractor by the Contracting Officer or his authorized representative.

(3) Final Payment. A final payment request shall not be considered valid until the Contractor has fulfilled all contract requirements including all administrative items, payrolls, warranties, etc. and has submitted a release of claims. When the Contractor has fulfilled all contract requirements and a "proper invoice" has been submitted, the Government shall issue a check within fourteen (14) days from the date of acceptance of the project by the Contracting Officer.

## 27. VERIFICATION OF SMALL BUSINESS UTILIZATION

a. This clause is applicable to small business concerns whose contracts exceed \$1,000,000.

b. In accordance with the clause at FAR 52.219-8, entitled UTILIZATION OF SMALL BUSINESS CONCERNS AND DISADVANTAGED BUSINESS CONCERNS, in effect on the date of this contract, the Contracting Office may survey the extent of small and small disadvantaged business utilization under this contract. The Contractor may be required to report to the Contracting Officer statistical data on the number and dollar amounts of subcontracting awards with small business and small disadvantaged businesses.

c. As appropriate, the Contracting Officer may require one or more follow-up reports to the initial report.

d. The Contractor agrees to insert this clause in any subcontract that may exceed \$1,000,000, including this subparagraph d.

## 28. SAFETY AND HEALTH REQUIREMENTS MANUAL

If this contract is for construction or dismantling, demolition, or removal of improvements with any Department of Army agency or component, the Contractor shall comply with all pertinent provisions of the latest version of U.S. Army Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1, in effect on the date of the solicitation. The latest edition of the U.S. Army Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1 and its changes are available at <http://www.hq.usace.army.mil> (at the HQ homepage select Safety and Occupational Health). Contractor shall be responsible for complying with the current edition and all changes posted on the web as of effective date of this solicitation.

Before commencing the work, the Contractor shall: (1) Submit a written proposal for implementing the Accident Prevention Plan; and (2) Meet with representatives of the Contracting Officer to discuss and develop a mutual understanding relative to administration of the overall safety program.

## 29. SUBMISSION OF CLAIMS

The following shall be submitted to the Contracting at the following address: U.S. Army Corps of Engineers, New York District, 26 Federal Plaza, New York, New York 10278-0090:

- a. Claims referencing or mentioning the Contracting Disputes Act of 1978.
- b. Requests for a written decision by the Contracting Officer.
- c. Claims certified in accordance with the Contract Disputes Act of 1978.

No other Government representative is authorized to accept such requests. A copy shall also be provided to the Authorized Representative of the Contracting Officer.

The Contractor shall also provide the Contracting Officer with a copy of any requests for additional time, money or interpretation of contract requirements which were provided to the Authorized Representative of the Contracting Officer and which have not been resolved after ninety (90) days.

## 30. PARTNERSHIP IMPLEMENTATION PLAN

To more effectively accomplish this contract, the Government proposes to form a partnership with the Contractor. This partnership would draw on the strengths of each organization in an effort to achieve a quality product within budget and on schedule. This partnership would be bilateral in make-up and participation by the Contractor is required and will be held, and facilitated by the Government representative and held at Government facilities. Subsequent partnership conferences will be held monthly, and will be facilitated by the Government representative and held at Government facilities. For subsequent monthly conferences the Government will prepare the agenda, and the Contractor will prepare and distribute minutes within 48 hours of the conclusion of the conference.



### 31. PRECONSTRUCTION CONFERENCE

a. A preconstruction conference will be arranged by the Contracting Officer, or his Representative, after award of contract and before commencement of work. The Contracting Officer's representative will notify the Contractor of the time and date set for the meeting. At this conference, the Contractor shall be oriented with respect to Government procedures and line of authority, contractual, administrative, and construction matters. Additionally, a schedule of required submittals will be discussed.

b. The Contractor shall bring to this conference the following items in either completed or draft form:

- The Contractor's order of work
- Accident Prevention Plan
- Quality Control Plan
- Letter appointing Superintendent
- List of subcontractors.

### 32. GOVERNMENT RESIDENT MANAGEMENT SYSTEM AND CONTRACTOR QUALITY CONTROL SYSTEM (QCS) MODULE

The Government will utilize an in-house Contract Administration program entitled "Resident Management System" (RMS). The Contractor shall utilize a Government furnished Quality Control System (QCS) Programming Module. See Section 01312A "Quality Control System (QCS)" for requirements.

### 33. COORDINATION CONFERENCES

Routine coordination conferences will be scheduled by the Contracting Officer throughout the life of this contract. Coordination conferences will be held to discuss contract administration, Contractor quality control, phasing, scheduling, and other aspects relating to this construction. The Corps of Engineers and the Contractor shall be represented at each of these meetings. Similar information concerning replacement personnel shall be forwarded to the Contracting Officer, should any replacement be required at any time during the life of this contract. Coordination conferences will be scheduled to occur in a weekly basis.

### 34. CRANE AND DRAGLINE SAFETY REQUIREMENTS

In addition to meeting all applicable requirements of OSHA standards and Section 16 of the U. S. Corps of Engineers Manual, "Safety and Health Requirements", EM 385-1-1, dated 3 September 1996, all cranes used in performing the work set forth in these specifications shall be equipped with geared boom hoists or otherwise provided with mechanisms which will prevent the booms from falling free. Cranes that are equipped with booms that can be lowered either by gravity or by power shall have the mechanisms for operating the booms by gravity made inoperative so that the booms cannot be lowered by gravity. The booms of all cranes and draglines shall also be equipped with shock absorbing type back stops to prevent them from overtopping.

All cranes shall have a red strobe light and two flags attached to the end of the boom. The flags shall be 18-inches square and international orange in color. The strobe does not need to be flashing during daylight hours or when the boom is lowered to the ground at night. The strobe shall be flashing when

operating during weather in which visibility is reduced or when operating at night. The strobe shall remain flashing if the boom remains elevated at night.

### 35. CONTRACTOR WORKING HOURS

Unless specifically authorized by the Contracting Officer, Contract work shall be restricted to the hours of 7:00 A.M. to 6:00 P.M., Mondays through Saturdays. No work will be permitted on Sundays and federal and state legal holidays. The Contractor shall comply with paragraph 01.c.04 of EM 385-1-1, the U.S. Army Corps of Engineers Safety and Health Requirements Manual, in effect on the date of this solicitation.

### 36 INSURANCE PROCURED BY CONTRACTOR AND THE PORT AUTHORITY

At the Government's option, to be exercised in writing no later than 45 days after the contract NTP, the Contractor shall procure and maintain during the entire period of its performance under this contract the following insurance policies:

The Contractor shall procure and maintain during the entire period of this performance under this contract the attached insurance policies:

#### A. Commercial Liability Insurance:

- 1) The Contractor shall take out and maintain at his own expense Commercial General Liability Insurance including but not limited to Premises-Operations, Completed Operations, coverage for explosion, collapse and underground property damage and Independent Contractor coverages in limits of not less than \$2,000,000 combined single limit per occurrence for Bodily Injury Liability and Property Damage Liability. And if vehicles are to be used to carry out the performance of this contract, then the Contractor shall also take out, maintain and pay the premiums on Automobile Liability Insurance covering all owned, non-owned and hired autos in not less than \$2,000,000 combined single limit per accident for bodily injury and property damage.

- 2) Environmental Liability Insurance:

The Contractor shall procure and maintain in force an Environmental Liability Insurance Policy covering the Contractor's pollution legal liability, including cleanup, with limits not less than \$4,000,000 per occurrence for bodily injury and property damage tailored to the specific exposures as they relate to the Work of this Contract.

Such policy and any certificate of insurance submitted hereunder in relation to such policy shall (I) be expressly endorsed for each Authority facility under this Contract and each transfer location, travel route and material disposition location selected by the Contractor, (II) state that claims disputes and coverage shall be litigated in United States courts having jurisdiction, and not be limited to arbitration, and (III) acknowledge the Contractor's disclosure to the insurance carrier that the material may be considered a hazardous substance/waste under applicable law including, but

not limited to, RCRA and/or CERCLA and/or the Toxic Substance Control Act (TSCA). It should be noted that the substances may be considered "hazardous" under CERCLA, but not necessarily "hazardous" under RCRA and that such materials if RCRA "hazardous" would require a manifest and disposal certificate under RCRA at a Subtitle C hazardous waste disposal facility. A copy of this Contract, including all schedules and documents attached hereto, shall be provided to the insurance carrier.

The policies providing for the above required liability insurance shall name the US Army Corps of Engineers, the Port Authority of New York & New Jersey and the People of the State of New York acting by and through the Commissioner of the Department of Environmental Conservation and KeySpan Corporation and all its affiliates, and subsidiaries, as additional insured ("Additional Insureds") and shall contain a provision that the policy may not be canceled, terminated or modified without thirty (30) days written advance notice to the Additional Insureds. Moreover, the Commercial General Liability policy shall not contain any provisions (other than a Professional Liability exclusion, if any) for exclusions from liability other than provisions or exclusions from liability forming part of the most up to date ISO form or its equivalent, unendorsed Commercial General Liability Policy. The liability policy (ies) and certificate of insurance shall contain cross-liability language providing severability of interests so that coverage will respond as if separate policies were in force for each insured. Furthermore, the Contractor's insurance shall be primary insurance as respects to the above additional insured (s), its representatives, officials, and employees. Any insurance or self insurance maintained by the above additional insured (s) shall not contribute to any loss or claim. These insurance requirements shall be in effect for the duration of the contract to include any warrantee/guarantee period. Further, the certificate of insurance and the liability Policy (ies) shall be specifically endorsed that "*The insurance carrier(s) shall not, without obtaining the express advance permission from the General Counsel of the Port Authority, raise any defense involving in any way the jurisdiction of the tribunal over the person of the Port Authority, the immunity of the Port Authority, its Commissioners, officers, agents or employees, the governmental nature of the Port Authority, or the provisions of any statutes respecting suits against the Port Authority.*"

- 3) Additional Coverages: The Contractor shall have the policy endorsed when required by the Additional Insureds for specific services hereunder and include the additional premium cost thereof as an out-of-pocket expense:
  - a) Endorsement to eliminate any exclusions on account of ownership, maintenance, operation, use, loading or unloading of watercraft.
  - b) Coverage for work within 50 feet of railroad.

**B. Workers' Compensation Insurance:**

- 1) The Contractor shall take out and maintain Workers' Compensation Insurance in accordance with the requirements of law and Employer's Liability Insurance with limits of not less than \$1,000,000 each accident.

- 2) Additional Coverages: The Contractor shall have the policy endorsed when required by the Additional Insureds for specific services hereunder and include the additional premium cost thereof as an out-of-pocket expense:
  - a) United States Longshoremen's and Harbor Workers' Compensation Act Endorsement.
  - b) Coverage B Endorsement - Maritime (Masters or Members of the Crew of Vessels), in limits of not less than \$1,000,000 per occurrence.
  - c) Amendments to Coverage B, Federal Employers' Liability Act in limits of not less than \$1,000,000 per occurrence.

C. Compliance:

Prior to commencement of work at the site, the Contractor shall deliver a certificate from its insurer evidencing policies of the above insurance stating the title of this Agreement, and containing a separate express statement of compliance with each of the requirements above set forth to the Additional Insureds.

- 1) Renewal certificates of insurance or policies shall be delivered to the Additional Insureds, at least fifteen (15) days prior to the expiration date of each expiring policy. The General Manager, Risk Management must approve the renewal certificate(s) of insurance before work can resume on the facility. If at any time any of the certificates or policies shall become unsatisfactory to the Port Authority, the Contractor shall promptly obtain a new and satisfactory certificate and policy.
- 2) If at any time the above liability insurance should be canceled, terminated, or modified so that the insurance is not in effect as above required, then, if the Additional Insureds shall so direct, the Contractor shall suspend performance of the contract at the premises. If the contract is so suspended, no extension of time shall be due on account thereof. If the contract is not suspended (whether or not because of omission of the Additional Insureds to order suspension), then the Additional Insureds may, at its option, obtain insurance affording coverage equal to the above required, the cost of such insurance to be payable by the Contractor to the Additional Insureds.
- 3) The Additional Insureds may at any time during the term of this agreement change or modify the limits and coverages of insurance. Should the modification or change results in an additional premium, the General Manager, Risk Management/Treasury for the Additional Insureds may consider such cost as an out-of-pocket expense.
- 4) Upon request of the General Manager, Risk Management/Treasury, the Contractor shall furnish to the Additional Insureds a certified copy of each policy itself, including the provisions establishing premiums.

5) The requirements for insurance procured by the Contractor shall not in any way be construed as a limitation on the nature or extent of the contractual obligations assumed by the Contractor under this contract. The insurance requirements are not a representation by the Additional Insureds as to the adequacy of the insurance to protect the Contractor against the obligations imposed on them by law or by this or any other Contract.

#### D. Payments

The Contractor and subcontractors shall comply with all obligations as insureds under or in connection with the above policy.

Payment items for insurance premium procured by the Contractor under this paragraph shall be for actual expenses at a price not to exceed the maximum listed in the Price/Bid schedule, optional Item No. 0014 (or CLIN 0014), Additional Cost for Optional Insurance, if the optional item is awarded as substantiated by the information provided by the Contractor's insurance carrier.

Contractor shall submit the following items to the government for payment and verification and only the actual amount will be reimbursed:

- 1-Insurance Policies.
- 2-Certification of insurance.
- 3-Proof of payments.

Payment for the insurance procured by the Contractor under this paragraph shall be in lump sum, "Additional Cost for Optional Insurance", if the optional item is awarded. (see notes in Bidding Schedule)

#### 37. PROGRESS PAYMENTS

Progress Payments made pursuant to the PAYMENTS TO CONTRACTOR clause for any item of work in the bid schedule shall be based on the contract unit price or lump sum amount set forth in the bid schedule for that item of work. If the amount of the unit price or lump sum bid for any item of work is in excess of 125% of the Government estimate for such item, the Contracting Officer may require the contractor to produce cost data to justify the price of the bid item. Failure to justify the bid item price to the satisfaction of the Contracting Officer may result in payment of an amount equal to 125% of the Government estimate for such bid item upon completion of work on the item and payment of the remainder of the bid item price upon final acceptance of all contract work.

#### 38. DAMAGE TO WORK

The responsibility for damage to any part of the permanent work shall be as set forth in the article of the contract clause entitled "PERMITS AND RESPONSIBILITIES". However, if in the judgment of the Contracting Officer, any part of the permanent work performed by the Contractor is damaged by flood, earthquake, hurricane, severe coastal storm or tornado, which damage is not due to the failure of the Contractor to take reasonable precautions or to exercise sound engineering and construction practices in the conduct of the work, the Contractor shall make the repairs as ordered by the Contracting Officer and full compensation for such repairs will be made at the applicable contract unit or lump-sum prices as fixed and established in the contract.

If, in the opinion of the Contracting Officer, there are no contract unit or lump sum prices applicable to any part of such work, an equitable adjustment, pursuant to Contract Clause entitled CHANGES, will be made as full compensation for the repairs of that part of the permanent work for which there are not applicable contract unit or lump-sum prices. Except as herein provided, damage to all work, utilities, materials, equipment, and plant, including temporary construction and utilities, pavements, and other property along the routes used by the Contractor's pipelines and/or land vehicles, shall be repaired to the satisfaction of the Contracting Officer, the State of New York, and the utilities companies, at the contractor's expense regardless of the cause of such damage.

### 39. IDENTIFICATION OF DISPOSAL FACILITY OR PROCESSING AND TREATMENT FACILITY FOR EXCAVATED CONTAMINATED MATERIALS

Prior to the start of construction, the contractor shall be responsible for the identification of a suitable disposal facility or processing and treatment facility, which can accept the materials to be excavated from the project area. The contractor shall be responsible to obtain approval from the State of New York Department of Environmental Conservation and the State of New Jersey, Department of Environmental Protection, Office of Dredging and Sediment Technology, in accordance with the State Water Quality Certification and Coastal Zone Consistency Statement, for use of the approved facility. The contractor shall also be responsible to receive approval from the Contracting Officer for use of the selected facility. Identification of the facility to be used should be coordinated with the Work Plan discussed in Section 02226.

### TIMES FOR EXCAVATION OF CONTAMINATED MATERIAL

In conjunction with the soil erosion and sediment control measures (Section 01553), excavation of contaminated material (Section 02233) will be restricted to times of low tide on exposed mud flats.

### 40. PERFORMANCE EVALUATION OF CONTRACTOR (1985 JAN HQ USACE)

a. As a minimum, the Contractor's performance will be evaluated upon final acceptance of the work. However, interim evaluations may be prepared at any time during contract performance when determined to be in the best interest of the Government.

b. The format for the evaluation will be SF 1421, and the Contractor will be rated either outstanding, satisfactory, or unsatisfactory in the areas of Contractor Quality Control, Timely Performance, Effectiveness of Management, Compliance with Labor Standards, and Compliance with Safety Standards. The Contractor will be advised of any unsatisfactory rating, either in an individual element or in the overall rating, prior to completing the evaluation, and all Contractor comments will be made a part of the official record. Performance Evaluation Reports will be available to all DoD contracting offices for their future use in determining Contractor responsibility, in compliance with DFARS 36.201(c)(1).

### 41. CONTINUING CONTRACT (Alternate) (1995 MAR)(EFARS)

a. Funds are not available at the inception of this contract to cover the entire contract price. The sum of \$50,000 to \$200,000 has been reserved for this contract and is available for payment to the contractor during the current fiscal year. It is expected that Congress will make appropriations for future fiscal years from which additional funds, together with funds provided by **the nonfederal project sponsor**

will be reserved for this contract. The liability of the United States for payments beyond the funds reserved for this contract is contingent on the reservation of additional funds.

b. Failure to make payments in excess of the amount currently reserved, or that may be reserved from time to time, shall not be considered a breach of this contract, and shall not entitle the contractor to a price adjustment under the terms of this contract except as specifically provided in paragraphs (e) and (h) below.

c. The Government may at any time reserve additional funds for payments under the contract if there are funds available for such purpose. The contracting officer will promptly notify the contractor of any additional funds reserved for the contract by issuing an administrative modification to the contract.

d. If earnings will be such that funds reserved for the contract will be exhausted before the end of any fiscal year, the contractor shall give written notice to the contracting officer of the estimated date of exhaustion and the amount of additional funds which will be needed to meet payments due or to become due under this contract during that fiscal year. This notice shall be given not less than 45 nor more than 60 days prior to the estimated date of exhaustion.

e. No payments will be made after exhaustion of funds except to the extent that additional funds are reserved for the contract. If and when sufficient additional funds are reserved, the contractor shall be entitled to simple interest on any payment that the contracting officer determines was actually earned under the terms of this contract and would have been made except for exhaustion of funds. Interest shall be computed from the time such payment would otherwise have been made until actually or constructively made, and shall be at the rate established by the Secretary of the Treasury pursuant to Public Law 92-41, 85 STAT 97, as in effect on the first day of the delay in such payment.

f. Any suspension, delay, or interruption of work arising from exhaustion or anticipated exhaustion of funds shall not constitute a breach of this contract and shall not entitle the contractor to any price adjustment under a "Suspension of Work" or similar clause or in any other manner under this contract.

g. An equitable adjustment in performance time shall be made for any increase in the time required for performance of any part of the work arising from exhaustion of funds or the reasonable anticipation of exhaustion of funds.

h. If, upon the expiration of sixty (60) days after the beginning of the fiscal year following an exhaustion of funds, the Government has failed to reserve sufficient additional funds to cover payments otherwise due, the contractor, by written notice delivered to the contracting officer at any time before such additional funds are reserved, may elect to treat his right to proceed with the work as having been terminated. Such a termination shall be at no cost to the Government, except that, to the extent that additional funds to make payment therefore are allocated to this contract, it may be treated as a termination for the convenience of the Government.

i. If at any time it becomes apparent that the funds reserved for any fiscal year are in excess of the funds required to meet all payments due or to become due the contractor because of work performed and to be performed under this contract during the fiscal year, the Government reserves the right, after notice to the contractor, to reduce said reservation by the amount of such excess.

j. The term "Reservation" means monies that have been set aside and made available for payments under this contract.

#### 42. STATE/LOCAL INCOME TAXES

The Contractor agrees that if during the performance of this contract it is relieved of its obligation to pay state and/or local income taxes on the income from this contract, an equitable adjustment will be made. The Contractor agrees to notify the Government within thirty (30) days of its relief from such taxes.



**Section 00908**  
**PA Boring logs**

Engineering Department  
Materials Engineering Division

## BORING REPORT

NOTES: 1 — Length recovered; 0" — Loss of Sample.  
2 — U = undisturbed.  
3 — Log depth of change in color of wash water, loss of water, artesian water, sand heave in casing, etc.

ENGINEERING DEPARTMENT  
MATERIALS ENGINEERING DIVISION  
PID READINGS

PROJECT: <u>BUG S. to</u>	DATE: <u>6/20/05 - 6/24/05</u>
BORING No. <u>BH-MW-1</u>	PID Model: <u>Mini Rat</u>
FIELD READINGS BY: <u>T. B.</u>	

[illegible]

3 — Log depth of change in color of wash water, loss of water, artesian water, sand heave in casing, etc.

# THE PORT AUTHORITY OF NY & NJ

Engineering Department  
Materials Engineering Division

## BORING REPORT

PROJECT <b>BUG SITE</b>				NAME OF CONTRACTOR <b>Craig</b>		BORING NO. <b>BH-MW-1B</b>		SHEET <b>1</b> OF <b>1</b>	
LOCATION <b>land out by H Mt Mt Don't</b>				CONTRACT NO. <b>426-33-012</b>		DATE <b>6/24/05</b>		SURFACE ELEV.	
SPOON "O.D." "I.D."		CASING SIZE		HOLE TYPE <b>1</b>		GROUND WATER LEVEL			
HAMMER # FALL "		HAMMER # FALL "		Date		Time		Depth	
								Remarks <b>No water</b>	
DRILLER <b>A. Truiano</b>									
INSPECTOR <b>T. R...</b>									

CASING BLOWS/FT.	DEPTH	SPOON BLOWS/6"	RE- <sup>1</sup> COV'D	SAMP. <sup>2</sup> NO.	<sup>3</sup> SAMPLE DESCRIPTION AND REMARKS LINE LOCATES CHANGE OF PROFILE (Phases through)
	0	<b>Hard</b>	<b>Full</b>	<b>1</b>	<b>Misc Fill - Br F Sand, some gravel, little gravel, to boulders</b>
	1	<b>Down</b>	<b>↓</b>	<b>2</b>	<b>Same w/ to boulders</b>
		<b>↓</b>	<b>↓</b>	<b>3</b>	<b>Same</b>
	2	<b>↓</b>	<b>↓</b>	<b>4</b>	<b>Same</b>
					<b>2.0'</b>
	3				<b>Bottom of Boring ↑</b>
					<b>Hit Concrete Slab - Manual Boring</b>
					<b>(See MW-1C)</b>
					<b>Note: No samples saved.</b>

NOTES: 1 — Length recovered; 0" — Loss of Sample.  
 2 — U = undisturbed.  
 3 — Log depth of change in color of wash water, loss of water, artesian water, sand heave in casing, etc.

# THE PORT AUTHORITY OF NY & NJ

Engineering Department  
Materials Engineering Division

## BORING REPORT

SHEET 1 OF 3  
SURFACE ELEV. ?

PROJECT <b>BUG SITE</b>		NAME OF CONTRACTOR <b>Craig</b>		BORING NO. <b>MW-1-C</b>	DATE <b>6/24/05</b>
LOCATION <b>laid out by H Matt M<sup>re</sup> Donald (±30' east of BH-MW-1)</b>				CONTRACT NO. <b>426-03-013</b>	
SPOON "O.D."	CASING SIZE "I.D."	HOLE TYPE "A Monitor"	GROUND WATER LEVEL		
HAMMER # FALL	HAMMER # FALL		Date <b>6/24/05</b>	Time <b>2:00 PM</b>	Depth <b>6.5'</b>
DRILLER <b>A. Tanciano</b>			Remarks <b>In SH #14</b>		
INSPECTOR <b>T. Ryan</b>					

CASING BLOWS/FT.	DEPTH	SPOON BLOWS/6"	RE-COV'D	SAMP. NO.	SAMPLE DESCRIPTION AND REMARKS LINE LOCATES CHANGE OF PROFILE (Phragmites)
	0	Hand Auger	Full	1	Mix Fill - B.M.F. Sand, some gravel, little boulders, to Boulders.
	1			2	Sand, some asphalt, Bricks)
				3	Sand
	2			4	Sand
				5	Sand
	3			6	Sand w/ little Boulders
				7	Sand
	4			8	Sand
				9	Sand
	5			10	Sand
				11	Sand
	6			12	Sand
				13	Bl. or silt/clay, some flat fibers
	7			14	Sand
				15	Sand w/ some sand
	8			16	Gray M-F Sand, lit Silt
				17	Sand
	9			18	Sand
				19	Sand
	10			20	Sand
					Bottom of Boring ↑ 10.0
					Note: No samples saved.

NOTES: 1 — Length recovered; 0" — Loss of Sample.

2 — U = undisturbed.

3 — Log depth of change in color of wash water, loss of water, artesian water, sand heave in casing, etc.

**PORT AUTHORITY OF NY & NJ**  
**Engineering Department - Materials Division**

**Well Installation Report**

Sheet 2 of 3

PROJECT <u>BUG Site</u>		CONTRACT NO. <u>426-03-013</u>	
LOCATION <u>laid out as per drawing then ± 30' east of BH-MW-1</u>		CONTRACTOR <u>Craig</u>	
WELL NO. <u>MW-1C</u>	WELL TYPE <u>A Monitor</u>	INSPECTOR <u>T. B.</u>	DRILLER <u>P. Pennell</u>
		DATE <u>6/24/05</u>	

**Well Development Report**

(NOTE: WATER LEVEL READINGS FROM TOP OF PVC)

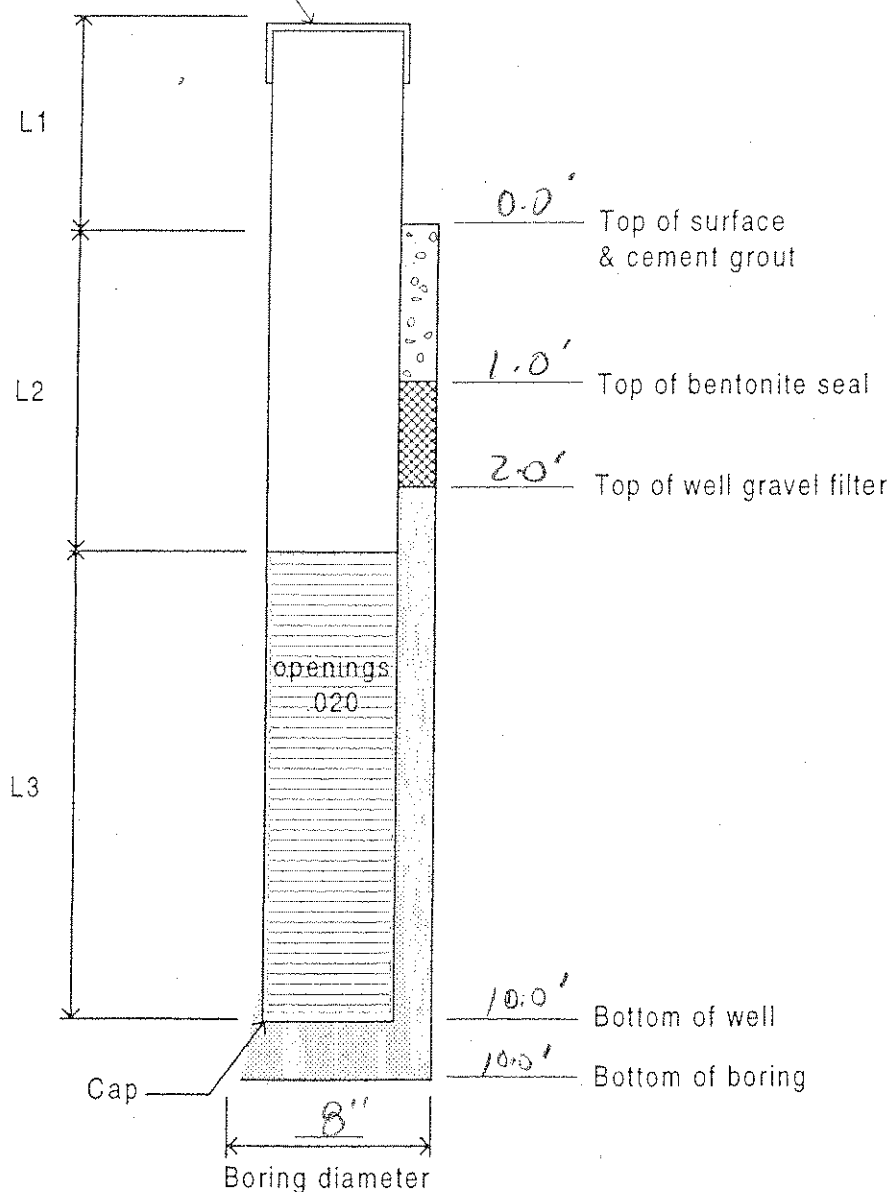
DATE <u>6/24/05</u>	WATER LEVEL BEFORE <u>9.3'</u>	WATER LEVEL AFTER <u>9.3'</u>	TAKEN <u>20</u> MINUTES AFTER
------------------------	-----------------------------------	----------------------------------	----------------------------------

2 " dia. PVC pipe w/ vented cap

L1 = 3.0'

L2 = 3.0'

L3 = 7.0'



REMARKS:

Sheet 3 of 3

PROJECT: <u>BUG Site</u>		Sheet 5 of 6	
BORING No. <u>MW-1C</u>		DATE: <u>6/24/05</u>	
FIELD READING BY: <u>T.R.</u>		PID Model: <u>Mini Rat</u>	

[illegible]



# THE PORT AUTHORITY OF NY & NJ

Engineering Department  
Materials Engineering Division

## BORING REPORT

SHEET 1 OF 3

PROJECT <b>BUG SITE</b>	NAME OF CONTRACTOR <b>Crane</b>	BORING NO. <b>MW-2</b>	SURFACE ELEV. <b></b>
LOCATION <b>As laid out as per drawing</b>		CONTRACT NO. <b>426-03-013</b>	DATE <b>6/20/05</b>

SPOON "O.D." "I.D."	CASING SIZE <b>H. 4.5" x 4.5"</b>	HOLE TYPE <b>A Monitor</b>	GROUND WATER LEVEL			
HAMMER "O.D." "I.D."	HAMMER "O.D." "I.D."	HAMMER "O.D." "I.D."	Date	Time	Depth	Remarks
# FALL	# FALL	# FALL	<b>6/20/05</b>	<b>9:35 A</b>	<b>3.7'</b>	<b>In S# 8</b>
DRILLER <b>P. Pennell</b>						
INSPECTOR <b>T. R.</b>						

CASING BLOWS/FT.	DEPTH	SPOON BLOWS/6"	RE- COV'D	SAMP. NO.	SAMPLE DESCRIPTION AND REMARKS LINE LOCATES CHANGE OF PROFILE
	0	Hand layer	Full	1	Fill - by M-F Sand, some Silt, Plast fiber Gravel, Boulder (Small)
	1			2	Misc fill - by F Sand, some Silt, little Gravel, & boulders.
	2			3	Same
	3			4	Same
	4			5	Same
	5			6	Same
	6			7	Same
	7			8	Same
	8			9	Same
	9			10	Same
	10			11	Bl org silt, Clay, little Plast fibers
	11				5.5'
	12				Bottom of Boring
	13				
	14				
	15				
	16				
	17				
	18				
	19				
	20				
	21				
	22				
	23				
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	49				
	50				

NOTES: 1 — Length recovered; 0" — Loss of Sample.  
2 — U = undisturbed.  
3 — Log depth of change in color of wash water, loss of water, artesian water, sand heave in casing, etc.

**PORT AUTHORITY OF NY & NJ**  
**Engineering Department - Materials Division**

**Well Installation Report**

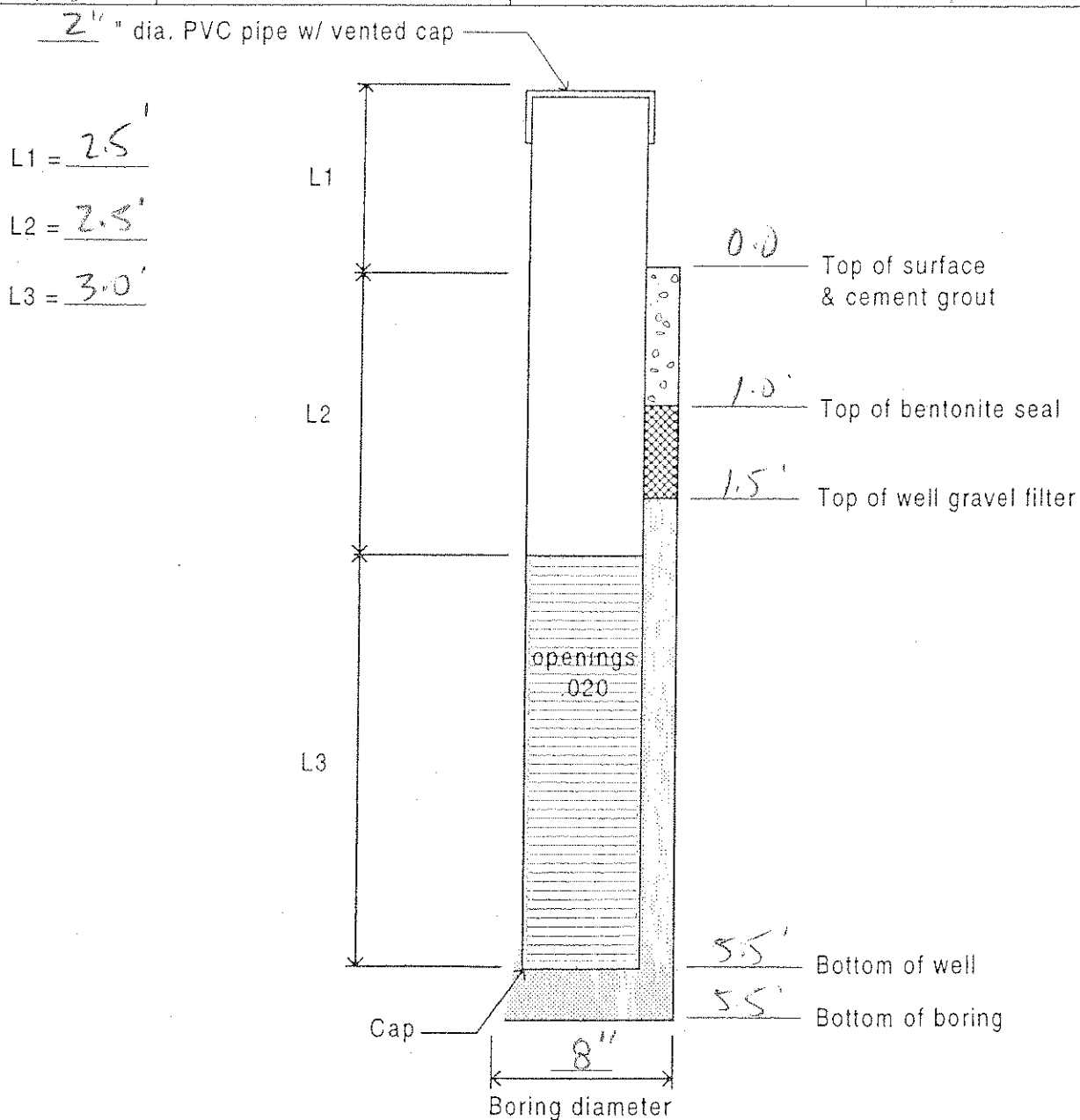
Sheet 2 of 3

PROJECT <u>BUG Site</u>		CONTRACT NO. <u>424-03-013</u>	
LOCATION <u>As laid out as per drawing</u>		CONTRACTOR <u>Craig</u>	
WELL NO. <u>MW-2</u>	WELL TYPE <u>A Monitor</u>	INSPECTOR <u>T. Ryan</u>	DRILLER <u>P. Pennell</u>
		DATE <u>6/20/05</u>	

**Well Development Report**

(NOTE: WATER LEVEL READINGS FROM TOP OF PVC)

DATE <u>6/20/05</u>	WATER LEVEL BEFORE <u>3.7'</u>	WATER LEVEL AFTER <u>3.7'</u>	TAKEN <u>15</u> MINUTES AFTER
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REMARKS:

ENGINEERING DEPARTMENT  
MATERIALS ENGINEERING DIVISION  
PID READINGS

Sheet 3 of 3

DATE: 6/20/05

PID Model: 12/1/2011

FIELD READINGS BY: T. R.

[illegible]

# THE PORT AUTHORITY OF NY & NJ

Engineering Department  
Materials Engineering Division

## BORING REPORT

SHEET 1 OF 1

PROJECT <i>Bug Site</i>			NAME OF CONTRACTOR <i>Craig</i>			BORING NO. <i>BH-MW-3</i>			SURFACE ELEV.		
LOCATION <i>Laid out as per drawing</i>						CONTRACT NO. <i>426-03-013</i>			DATE <i>6/21/05</i>		
SPOON "O.D." "I.D."		CASING SIZE		HOLE TYPE <i>1</i>		GROUND WATER LEVEL					
HAMMER # FALL "		HAMMER # FALL "				Date	Time	Depth	Remarks		
						<i>6/21/05</i>	<i>2<sup>00</sup> pm</i>	<i>—</i>	<i>No water</i>		
DRILLER <i>A. Tricomico</i>											
INSPECTOR <i>T. Ryan</i>											

CASING BLOWS/FT.	DEPTH	SPOON BLOWS/6"	RE- COV'D	SAMP. <sup>2</sup> NO.	<sup>3</sup> SAMPLE DESCRIPTION AND REMARKS LINE LOCATES CHANGE OF PROFILE	
	0	<i>Hard Auger</i>	<i>Full</i>	1	<i>Misc Fill for M-F Sand, little Gravel, to Boulders</i>	
	1			2	<i>Sand</i>	
	3			<i>Sand</i>		
	4			<i>Sand</i>		
	5			<i>Sand</i>		
	6			<i>Sand</i>		
	7			<i>Sand</i>		
	8			<i>Sand w/ some Core / Steel.</i>		
	9					
	10					
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					
	20					
	21					
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	49					
	50					

*Hit Core / Steel, Moved Boring*

*(See MW-3)*

*Note: No sample taken*

NOTES: 1 — Length recovered; 0" — Loss of Sample.  
2 — U = undisturbed.  
3 — Log depth of change in color of wash water, loss of water, artesian water, sand heave in casing, etc.

3 — Log depth of change in color of wash water, loss of water, artesian water, sand heave in casing, etc.

**PORT AUTHORITY OF NY & NJ**  
**Engineering Department - Materials Division**

**Well Installation Report**

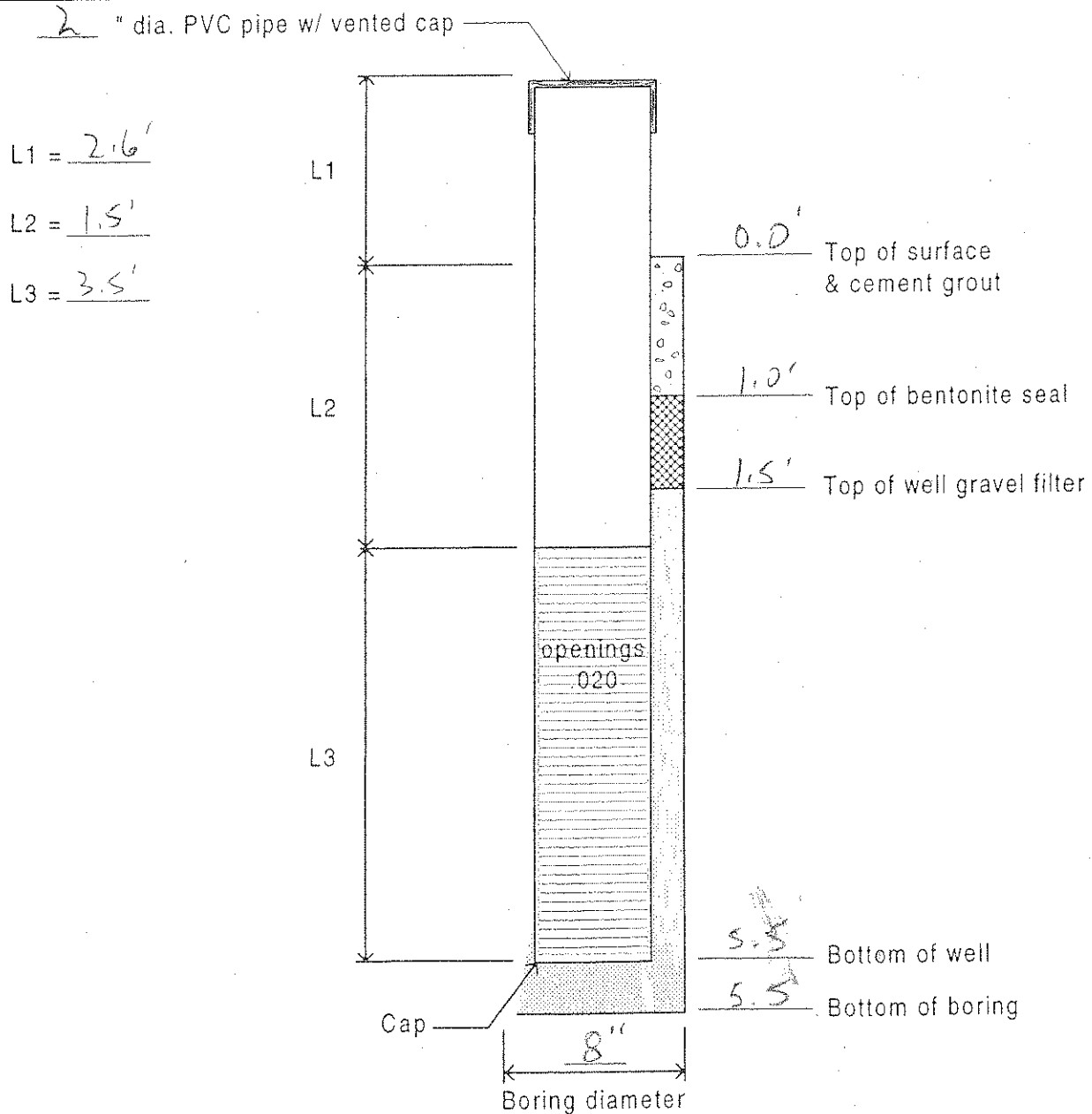
Sheet 2 of 3

PROJECT <u>BUG Site</u>				CONTRACT NO. <u>426-03-013</u>	
LOCATION <u>Lead out as per drawing</u>				CONTRACTOR <u>Craig</u>	
WELL NO. <u>MW-3</u>	WELL TYPE <u>A Monitor</u>	INSPECTOR <u>T. Rye</u>	DRILLER <u>A. Trucanico</u>	DATE <u>6/22/05</u>	

**Well Development Report**

(NOTE: WATER LEVEL READINGS FROM TOP OF PVC)

DATE <u>6/22/05</u>	WATER LEVEL BEFORE <u>2.9'</u>	WATER LEVEL AFTER <u>2.9'</u>	TAKEN <u>15</u> MINUTES AFTER
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REMARKS:

Sheet 3 of 3

PROJECT:	BUG Site	
BORING No.	MW-3	DATE: 6/21/05
FIELD READING BY:	T. R.	PID Model: Mini Pac

[illegible]

# THE PORT AUTHORITY OF NY & NJ

Engineering Department  
Materials Engineering Division

## BORING REPORT

SHEET 1 OF 3

PROJECT <i>BUG Site</i>		NAME OF CONTRACTOR <i>Craig</i>		BORING NO. <i>MW-4</i>	SURFACE ELEV.
LOCATION <i>Laid out as per drawing</i>		CONTRACT NO. <i>426-03-013</i>		DATE <i>6/22/05</i>	
SPOON "O.D."	CASING SIZE "I.D."	HOLE TYPE <i>A Monitor</i>	GROUND WATER LEVEL		
HAMMER # FALL	HAMMER # FALL		Date <i>6/22/05</i>	Time <i>8:15 A</i>	Depth <i>1.0'</i>
DRILLER <i>A. Tricario</i>		Remarks <i>In SH 2</i>			
INSPECTOR <i>T. R.</i>					

CASING BLOWS/FT.	DEPTH	SPOON BLOWS/6"	RE- COV'D	SAMP. NO.	SAMPLE DESCRIPTION AND REMARKS LINE LOCATES CHANGE OF PROFILE
	0	<i>Hard</i>	<i>Full</i>	1	<i>Blow silty Clay &amp; Peat, little Plant fibers (roots)</i>
	1	<i>Arger</i>	<i>Re</i>	2	<i>Same</i>
				3	<i>Blow Clay &amp; Peat</i>
	2			4	<i>Same</i>
				5	<i>Same</i>
	3			6	<i>Same</i>
				7	<i>Same</i>
	4			8	<i>Same</i>
				9	<i>Same</i>
	5			10	<i>Same</i>
	6				<i>Bottom of Boring</i>

*50'*

*Note: No samples taken.*

NOTES: 1 — Length recovered; 0" — Loss of Sample.  
2 — U = undisturbed.  
3 — Log depth of change in color of wash water, loss of water, artesian water, sand heave in casing, etc.



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**Engineering Department - Materials Division**

**Well Installation Report**

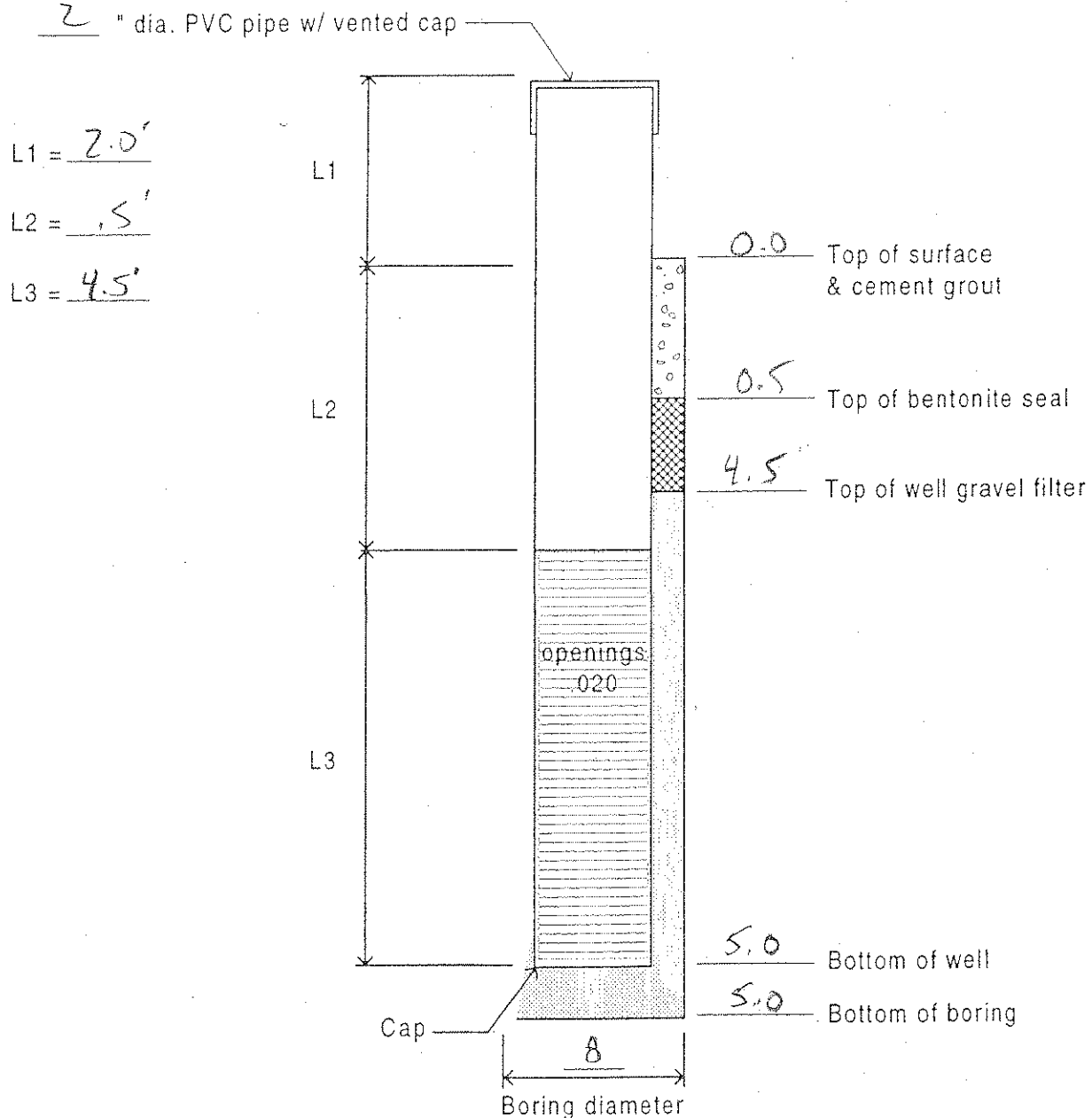
Sheet 2 of 3

PROJECT <u>BUG Site</u>				CONTRACT NO. <u>426-03-013</u>	
LOCATION <u>Laid out as per drawing</u>				CONTRACTOR <u>Craig</u>	
WELL NO. <u>MW-4</u>	WELL TYPE <u>A Monitor</u>	INSPECTOR <u>T. Ryan</u>	DRILLER <u>A. Trucanico</u>	DATE <u>6/22/05</u>	

**Well Development Report**

(NOTE: WATER LEVEL READINGS FROM TOP OF PVC)

DATE <u>6/22/05</u>	WATER LEVEL BEFORE <u>1.0'</u>	WATER LEVEL AFTER <u>1.0'</u>	TAKEN <u>15</u> MINUTES AFTER
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REMARKS:



NOTES: 1 — Length recovered; 0"—Loss of Sample.  
2 — U = undisturbed.  
3 — Log depth of change in color of wash water, loss of water, artesian water, sand heave in casing, etc.

**PORT AUTHORITY OF NY & NJ**  
**Engineering Department - Materials Division**

**Well Installation Report**

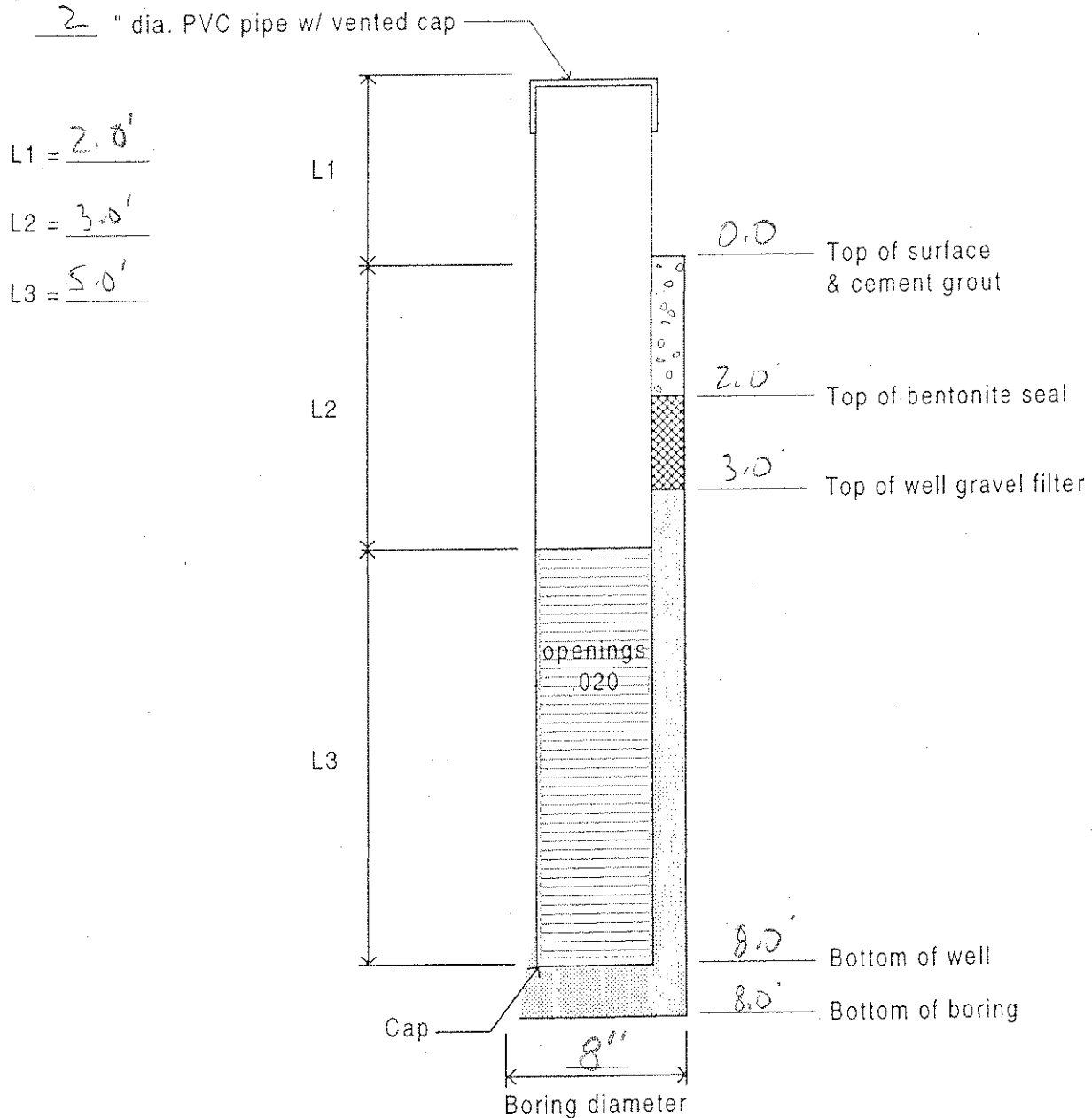
Sheet 2 of 3

PROJECT <u>BUG Site</u>		CONTRACT NO. <u>426-03-013</u>	
LOCATION <u>Laid out as per drawing then ± 16' west</u>		CONTRACTOR <u>Craig</u>	
WELL NO. <u>MW-5</u>	WELL TYPE <u>A Monitor</u>	INSPECTOR <u>T.R.</u>	DRILLER <u>A. Truciano</u>
		DATE <u>6/23/05</u>	

**Well Development Report**

(NOTE: WATER LEVEL READINGS FROM TOP OF PVC)

DATE	WATER LEVEL BEFORE	WATER LEVEL AFTER	TAKEN	MINUTES AFTER
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REMARKS:

ENGINEERING DEPARTMENT  
MATERIALS ENGINEERING DIVISION  
PID READINGS

FIELD READINGS BY: T.K.

[illegible]



**PORT AUTHORITY OF NY & NJ**  
**Engineering Department - Materials Division**

**Well Installation Report**

Sheet 2 of 4

PROJECT <u>BUE Site</u>		CONTRACT NO. <u>426-03-013</u>	
LOCATION <u>laid out as per drawing</u>		CONTRACTOR <u>Craig</u>	
WELL NO. <u>MW-6/BUE-20V</u>	WELL TYPE <u>A Monitor</u>	INSPECTOR <u>TB</u>	DRILLER <u>A. Truciano</u>
		DATE <u>6/23/05</u>	

**Well Development Report**

(NOTE: WATER LEVEL READINGS FROM TOP OF PVC)

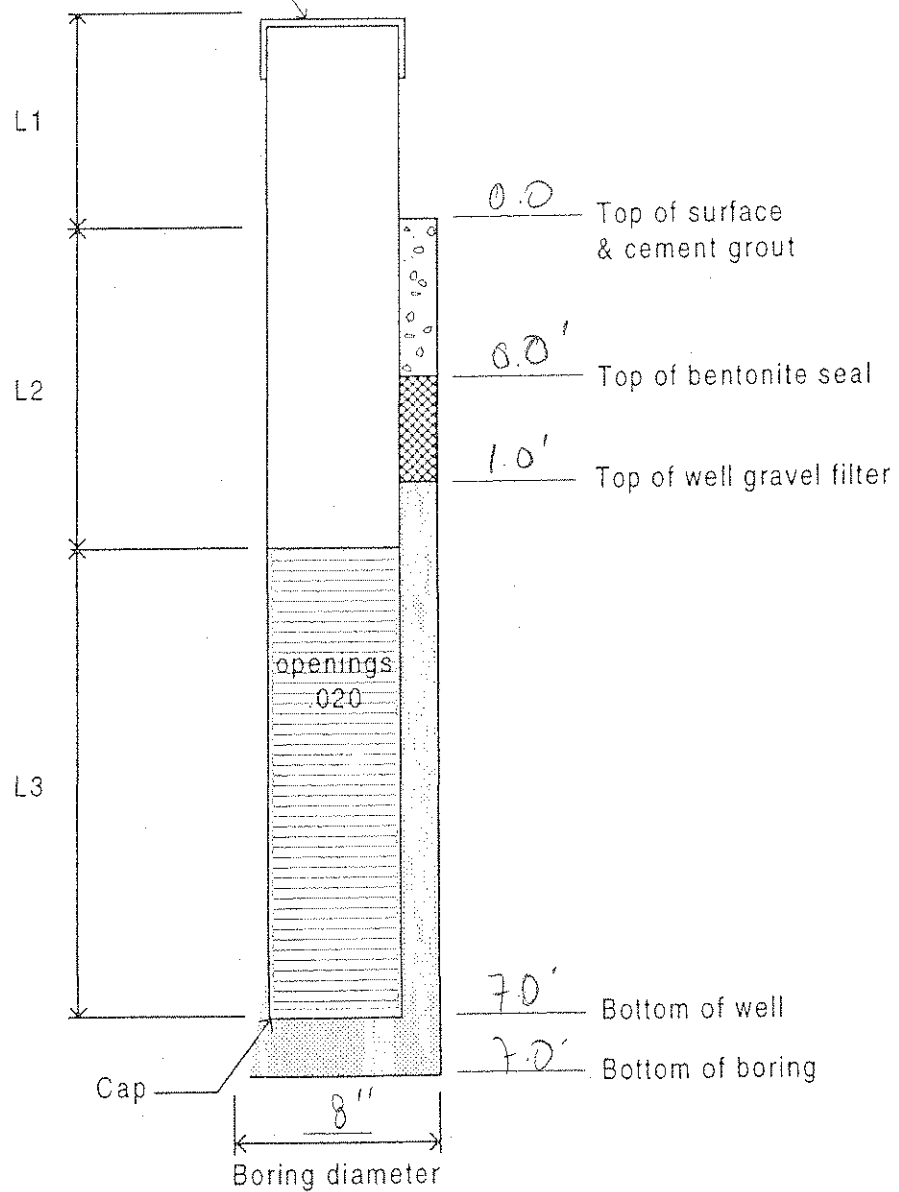
DATE	WATER LEVEL BEFORE	WATER LEVEL AFTER	TAKEN MINUTES AFTER
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2 " dia. PVC pipe w/ vented cap

L1 = 1.0'

L2 = 2.0'

L3 = 5.0'



REMARKS:

ENGINEERING DEPARTMENT  
MATERIALS ENGINEERING DIVISION  
PID READINGS

PROJECT:	BUG Site		DATE:	6/23/05
BORING No.	MW-6 / BUG-20V		PID Model:	Mini Rac
FIELD READINGS BY:	T.B.			

[illegible]



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ENGINEERING DEPARTMENT  
MATERIALS ENGINEERING DIVISION  
CHAIN OF CUSTODY RECORD

Sheet 4 of 4

PROJECT: BUG Site	
LOCATION: laid out, as per drawing	DATE: 6/23/05
BORING No: MW-6 / BUG-20V	TOTAL No. OF SAMPLES: 2

SIGNATURE OF ALL

PRESENT AT SAMPLING

T.B.

RELINQUISHED

DATE 6/23/05

RECEIVED

BY (SIGN)

T.B.

TIME

BY (SIGN)

RELINQUISHED

DATE

RECEIVED

BY (SIGN)

TIME

BY (SIGN)

RELINQUISHED

DATE

RECEIVED

BY (SIGN)

TIME

BY LAB

REMARKS:

2 Samples vs 2-16oz jars

Note: Hold S# 4, if S# 3 is clean, do not test.

# THE PORT AUTHORITY OF NY & NJ

Engineering Department  
Materials Engineering Division

## BORING REPORT

SHEET 1 OF 3

PROJECT <b>BUG</b>		NAME OF CONTRACTOR <b>Craig</b>		BORING NO. <b>BUG-1V</b>	SURFACE ELEV.
LOCATION <b>Boiled out as per drawing</b>				CONTRACT NO. <b>426-03-013</b>	DATE <b>6/20/05</b>
SPOON "O.D." "I.D."	CASING SIZE	HOLE TYPE <b>1</b>	GROUND WATER LEVEL		
HAMMER # FALL	HAMMER # FALL		Date <b>6/20/05</b>	Time <b>1:50 p</b>	Depth <b>4.5'</b>
DRILLER <b>S. Burns</b>			Remarks <b>In SH 10</b>		
INSPECTOR <b>T.R.</b>					

CASING BLOWS/FT.	DEPTH	SPOON BLOWS/6"	RE- COV'D	SAMP. NO.	SAMPLE DESCRIPTION AND REMARKS LINE LOCATES CHANGE OF PROFILE
	0	Hard	Full	1	Blue Fill - Br FSad & Silty little flat fibers, lit gravel. (phragmites)
	1	Argo	Rec.	2	Same w/ lit Boulders (conc & brick)
				3	Same
	2			4	Same
				5	Same
	3			6	Same
				7	Same
	4			8	Same
				9	Same
	5			10	Same
				11	Same
	6			12	Bl or g silty clay
					5.5'
					6.0'
					Bottom of Boring

Note: Samples # 8 (3.5'-4') & 12 (5.5'-6') were saved.  
All other samples were screened w/ PIDE  
then discarded.

NOTES: 1 — Length recovered; 0" — Loss of Sample.  
2 — U = undisturbed.  
3 — Log depth of change in color of wash water, loss of water, artesian water, sand heave in casing, etc.

ENGINEERING DEPARTMENT  
MATERIALS ENGINEERING DIVISION  
PID READINGS

Sheet 2 of 3

PID Model: None

[illegible]

# THE PORT AUTHORITY OF N.Y & N.J.

## ENGINEERING DEPARTMENT MATERIALS ENGINEERING DIVISION CHAIN OF CUSTODY RECORD

Sheet 3 of 3

PROJECT: <u>Beib</u>	
LOCATION: <u>handout as per drawing</u>	DATE: <u>6/20/05</u>
BORING No: <u>BUG-1V</u>	TOTAL No. OF SAMPLES: <u>2</u>

SIGNATURE OF ALL  
PRESENT AT SAMPLING

T.R.

RELINQUISHED	DATE <u>6/20/05</u>	RECEIVED
BY (SIGN) <u>T.R.</u>	TIME	BY (SIGN)

RELINQUISHED	DATE	RECEIVED
BY (SIGN)	TIME	BY (SIGN)

RELINQUISHED	DATE	RECEIVED
BY (SIGN)	TIME	BY LAB

REMARKS: 2 samples in 2-16 oz jars

NOTES: 1 — Length recovered; 0" — Loss of Sample.  
2 — U = undisturbed.  
3 — Log depth of change in color of wash water, loss of water, artesian water, sand heave in casing, etc.

ENGINEERING DEPARTMENT  
MATERIALS ENGINEERING DIVISION  
PID READINGS

PROJECT: <u>BUG - Site</u>		DATE: <u>6/13/05</u>
BORING No. <u>BAG-4V</u>		PID Model: <u>Mini Ra</u>
FIELD READINGS BY: <u>TR</u>		

[illegible]

# THE PORT AUTHORITY OF N.Y & N.J.

ENGINEERING DEPARTMENT

MATERIALS ENGINEERING DIVISION

CHAIN OF CUSTODY RECORD

Sheet 3 of 3

PROJECT: BUG - Site

LOCATION: as laid out by HM MacDonald

DATE: 6/13/05

BORING No: BUG - 4V

TOTAL No. OF SAMPLES: 2

SIGNATURE OF ALL

PRESENT AT SAMPLING

T.R.-

RELINQUISHED

DATE 6/13/05 RECEIVED

BY (SIGN)

T.R.-

TIME

BY (SIGN)

RELINQUISHED

DATE

RECEIVED

BY (SIGN)

TIME

BY (SIGN)

RELINQUISHED

DATE

RECEIVED

BY (SIGN)

TIME

BY LAB

REMARKS: 2 samples in 2-16 oz jars.

Note: Sample # 15 will only be tested if 5-14 is contaminated.

3 — Log depth of change in color of wash water, loss of water, artesian water, sand heave in casing, etc.



ENGINEERING DEPARTMENT  
MATERIALS ENGINEERING DIVISION  
PID READINGS

PROJECT: Bug-Site

DATE: 6/15/05

BORING No. 6-03-5V

PID Model: Mini Ka

FIELD READINGS BY:

[illegible]

# THE PORT AUTHORITY OF N.Y & N.J.

## ENGINEERING DEPARTMENT MATERIALS ENGINEERING DIVISION CHAIN OF CUSTODY RECORD

Sheet 3 of 3

PROJECT: Bug - Silt	
LOCATION: As laid out by HM <sup>M<sup>20</sup></sup> Donaldson per draw	DATE: 6/15/05
BORING No: BUG-SV	TOTAL No. OF SAMPLES: 2

SIGNATURE OF ALL

PRESENT AT SAMPLING

T.R.-

RELINQUISHED

DATE 6/1/05 RECEIVED

BY (SIGN)

T.R.-

TIME

BY (SIGN)

RELINQUISHED

DATE

RECEIVED

BY (SIGN)

TIME

BY (SIGN)

RELINQUISHED

DATE

RECEIVED

BY (SIGN)

TIME

BY LAB

REMARKS: 2 Samples in 2-16 oz jars

Sample # 13 on hold. If S# 12 is OK disregard S-13. Do not test.

# THE PORT AUTHORITY OF NY & NJ

Engineering Department  
Materials Engineering Division

## BORING REPORT

SHEET 1 OF 3

PROJECT <i>BUG Site</i>		NAME OF CONTRACTOR <i>Craig</i>		BORING NO. <i>BUG-6V</i>	SURFACE ELEV.
LOCATION <i>As laid out by H M MacDonald as per drawing</i>				CONTRACT NO. <i>426-03-013</i>	DATE <i>6/14/05</i>
SPOON "O.D."	"I.D."	CASING SIZE	HOLE TYPE <i>1</i>	GROUND WATER LEVEL	
HAMMER # FALL		HAMMER # FALL		Date <i>6/14/05</i>	Time <i>2<sup>30</sup> P</i>
DRILLER <i>T. Parnichand</i>		INSPECTOR <i>T. Ryan</i>		Depth <i>7.0'</i>	Remarks <i>In S# 14</i>

CASING BLOWS/FT.	DEPTH	SPOON BLOWS/6"	RE- COV'D	SAMP. NO.	SAMPLE DESCRIPTION AND REMARKS LINE LOCATES CHANGE OF PROFILE (Phenomena)
		<i>Hand</i>	<i>Full</i>	<i>1</i>	<i>Top Soil - Br cln. Silt, some plant fibers/roots, to gravel.</i>
	<i>1</i>	<i>Auger</i>	<i>Rec</i>	<i>2</i>	<i>with Br m-F Sand, lit Silt, Silt gravel, to cobbles.</i>
				<i>3</i>	<i>Rubble Fill - Br m-F Sand, little Bricks, cone, metal</i>
	<i>2</i>			<i>4</i>	<i>Same</i>
				<i>5</i>	<i>Same</i>
	<i>3</i>			<i>6</i>	<i>Same w/ to wood</i>
				<i>7</i>	<i>Same</i>
	<i>4</i>			<i>8</i>	<i>Same</i>
				<i>9</i>	<i>Same w/ lit. Cobbles, to Boulder (uplift cone)</i>
	<i>5</i>			<i>10</i>	<i>Same</i>
				<i>11</i>	<i>Same</i>
	<i>6</i>			<i>12</i>	<i>Same</i>
				<i>13</i>	<i>Same</i>
	<i>7</i>			<i>14A</i>	<i>Same</i>
				<i>15</i>	<i>Br of city clay, little F Sand</i>
	<i>8</i>			<i>16</i>	<i>Same</i>
					<i>Bottom of Boring</i>

NOTES: 1 — Length recovered; 0" — Loss of Sample.  
2 — U = undisturbed.  
3 — Log depth of change in color of wash water, loss of water, artesian water, sand heave in casing, etc.

*Note: Samples # 15 (7.2'-7.7') & 16 (7.7'-8.2') were saved. All other samples were screened w/ PID & then discarded.*

ENGINEERING DEPARTMENT  
MATERIALS ENGINEERING DIVISION  
PID READINGS

PROJECT:	BUG - Site	DATE:	6/14/05
BORING No.	BUG-6V	PID Model:	Mini Ras
FIELD READINGS BY:	T.R. -		

[illegible]

# THE PORT AUTHORITY OF N.Y & N.J.

ENGINEERING DEPARTMENT

MATERIALS ENGINEERING DIVISION

CHAIN OF CUSTODY RECORD

Sheet 3 of 3

PROJECT: Bug - Site

LOCATION: As laid out by H.M. MacDonald.

DATE: 6/14/05

BORING No: Bug - 6v

TOTAL No. OF SAMPLES: 2

SIGNATURE OF ALL

PRESENT AT SAMPLING

T.R.

RELINQUISHED

DATE 6/14/05 RECEIVED

BY (SIGN)

T.R.

TIME

BY (SIGN)

RELINQUISHED

DATE

RECEIVED

BY (SIGN)

TIME

BY (SIGN)

RELINQUISHED

DATE

RECEIVED

BY (SIGN)

TIME

BY LAB

REMARKS: 2 Samples in 2-16 oz jars

Note: Sample # 16 do not test if S-15 is OK.

3 — Log depth of change in color of wash water, loss of water, artesian water, sand heave in casing, etc.

ENGINEERING DEPARTMENT  
MATERIALS ENGINEERING DIVISION  
PID READINGS

PROJECT: Bug-Site

DATE: 6/15/07

BORING No. ECG-8V

PID Model: Mini Kase

FIELD READINGS BY:

[illegible]

# THE PORT AUTHORITY OF N.Y & N.J.

ENGINEERING DEPARTMENT  
MATERIALS ENGINEERING DIVISION  
CHAIN OF CUSTODY RECORD

Sheet 3 of 3

PROJECT: Bug - Site	
LOCATION: As laid out by H.M. McDonald & Cooper drawing	DATE: 6/15/05
BORING No: BUG - 8V	TOTAL No. OF SAMPLES: 2

SIGNATURE OF ALL

PRESENT AT SAMPLING

T.R.

RELINQUISHED

DATE 6/15/05

RECEIVED

BY (SIGN)

T.R.

TIME

BY (SIGN)

RELINQUISHED

DATE

RECEIVED

BY (SIGN)

TIME

BY (SIGN)

RELINQUISHED

DATE

RECEIVED

BY (SIGN)

TIME

BY LAB

REMARKS:

2 samples in 2-14 oz jars

Note: Irregular S# 9 if S# 8 is OK



NOTES: 1 — Length recovered; 0"—Loss of Sample.  
2 — U = undisturbed.  
3 — Log depth of change in color of wash water, loss of water, artesian water, sand heave in casing, etc.

ENGINEERING DEPARTMENT  
MATERIALS ENGINEERING DIVISION  
PID READINGS

Sheet 2 of 3

BUG SITE

Aug-13V

6/21/05

TK

*Handwritten signature*

[illegible]

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ENGINEERING DEPARTMENT  
MATERIALS ENGINEERING DIVISION  
CHAIN OF CUSTODY RECORD

Sheet 3 of 3

PROJECT: <b>BUG SITE</b>	
LOCATION: <b>hand out as per drawing</b>	DATE: <b>6/21/05</b>
BORING No: <b>BUG-13 V</b>	TOTAL No. OF SAMPLES: <b>2</b>

SIGNATURE OF ALL

PRESENT AT SAMPLING

**T.R. -**

RELINQUISHED

DATE **6/21/05**

RECEIVED

BY (SIGN)

**T.R. -**

TIME

BY (SIGN)

RELINQUISHED

DATE

RECEIVED

BY (SIGN)

TIME

BY (SIGN)

RELINQUISHED

DATE

RECEIVED

BY (SIGN)

TIME

BY LAB

REMARKS:

**2 samples in 2-16 oz jars**

**Note: Hold S#9 if S#8 is clean.**

Engineering Department  
Materials Engineering Division

## BORING REPORT

SHEET 7 OF

NOTES: 1 — Length recovered; 0" — Loss of Sample.  
2 — U = undisturbed.  
3 — Log depth of change in color of wash water, loss of water, artesian water, sand heave in casing, etc.

ENGINEERING DEPARTMENT  
MATERIALS ENGINEERING DIVISION  
PID READINGS

Sheet 2 of 3

DATE: 6/6/85

PID Model: *John Doe*

FIELD READINGS BY: T. Y. G.

[illegible]

# THE PORT AUTHORITY OF N.Y & N.J.

ENGINEERING DEPARTMENT  
MATERIALS ENGINEERING DIVISION  
CHAIN OF CUSTODY RECORD

Sheet 3 of 3

PROJECT: Bug Site	
LOCATION: As laid out by HM MacDonald	DATE: 6/16/05
BORING No: BUG-18V	TOTAL No. OF SAMPLES: 2

SIGNATURE OF ALL

PRESENT AT SAMPLING

T.Ry-

RELINQUISHED	DATE 6/16/05	RECEIVED
BY (SIGN)	TIME	BY (SIGN)

T.Ry-

RELINQUISHED	DATE	RECEIVED
BY (SIGN)	TIME	BY (SIGN)

RELINQUISHED	DATE	RECEIVED
BY (SIGN)	TIME	BY LAB

REMARKS: 2 samples in 2-16 oz jars

Note: Sample #9 on hold if S#8 is OK ~~do not~~ test #9.

Engineering Department  
Materials Engineering Division

## SHEET OF

NOTES: 1 — Length recovered; 0"—Loss of Sample.  
2 — U = undisturbed.  
3 — Log depth of change in color of wash water, loss of water, artesian water, sand heave in casing, etc.

ENGINEERING DEPARTMENT  
MATERIALS ENGINEERING DIVISION  
PID READINGS

PROJECT: BUG Site

BORING No. BUG-21

DATE: 6/17/07

FIELD READINGS BY: TK

PID Model: Mini K

[illegible]



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ENGINEERING DEPARTMENT  
MATERIALS ENGINEERING DIVISION  
CHAIN OF CUSTODY RECORD

Sheet 3 of 3

PROJECT: <i>BUG Site</i>	
LOCATION: <i>Laid out as per drawing</i>	DATE: <i>6/20/05</i>
BORING No: <i>BUG-21</i>	TOTAL No. OF SAMPLES: <i>2 + 1 FB</i>

SIGNATURE OF ALL

PRESENT AT SAMPLING

RELINQUISHED

BY (SIGN)

DATE

TIME

RECEIVED

BY (SIGN)

RELINQUISHED

BY (SIGN)

DATE

TIME

RECEIVED

BY (SIGN)

RELINQUISHED

BY (SIGN)

DATE

TIME

RECEIVED

BY LAB

REMARKS:

*2 Samples in 2-16 oz jars  
1 FB in 2 vials*

NOTES: 1 — Length recovered; 0" — Loss of Sample.  
2 — U = undisturbed.  
3 — Log depth of change in color of wash water, loss of water, artesian water, sand heave in casing, etc.

ENGINEERING DEPARTMENT  
MATERIALS ENGINEERING DIVISION  
PID READINGS

Sheet 2 of 3

PROJECT:	BUG Site	DATE:	6/17/05
BORING No.	BUG-22	PID Model:	Mini Rod
FIELD READINGS BY:	T.R.		

[illegible]

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ENGINEERING DEPARTMENT

MATERIALS ENGINEERING DIVISION

CHAIN OF CUSTODY RECORD

Sheet 3 of 3

PROJECT: <i>BUG Site</i>	
LOCATION: <i>As laid out as per drawing</i>	DATE: <i>6/17/05</i>
BORING No: <i>BUG-22</i>	TOTAL No. OF SAMPLES: <i>2</i>

SIGNATURE OF ALL  
PRESENT AT SAMPLING

*T.R.-*

RELINQUISHED	DATE <i>6/17/05</i>	RECEIVED
BY (SIGN) <i>T.R.-</i>	TIME	BY (SIGN)

RELINQUISHED	DATE	RECEIVED
BY (SIGN)	TIME	BY (SIGN)

RELINQUISHED	DATE	RECEIVED
BY (SIGN)	TIME	BY LAB

REMARKS: *2-samples in 2-16oz jars.*

*Note: Sample #13 is on HOLD, do not test if  
S#12 is OK.*

Engineering Department  
Materials Engineering Division

## BORING REPORT

SHEET OF

[illegible]

NOTES: 1 — Length recovered; 0" — Loss of Sample.

2 — U = undisturbed.

3 — Log depth of change in color of wash water, loss of water, artesian water, sand heave in casing, etc.

ENGINEERING DEPARTMENT  
MATERIALS ENGINEERING DIVISION  
PID READINGS

PROJECT: BUG- Site	DATE: 6/16/05
BORING No. BUG-23	PID Model: Mini Rac
FIELD READINGS BY: TR-	

[illegible]

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ENGINEERING DEPARTMENT  
MATERIALS ENGINEERING DIVISION  
CHAIN OF CUSTODY RECORD

Sheet 3 of 3

PROJECT: <u>BUG - Site</u>	
LOCATION: <u>holed out by H Mott as per drawing</u>	DATE: <u>6/16/05/6/17/05</u>
BORING No: <u>BUG-23</u>	TOTAL No. OF SAMPLES: <u>2 + 1 FB</u>

SIGNATURE OF ALL

PRESENT AT SAMPLING

T.R. -

RELINQUISHED

BY (SIGN)

T.R. -

DATE 6/16/05

TIME

RECEIVED

BY (SIGN)

RELINQUISHED

BY (SIGN)

DATE

TIME

RECEIVED

BY (SIGN)

RELINQUISHED

BY (SIGN)

DATE

TIME

RECEIVED

BY LAB

REMARKS:

2 Samples in 2-16 oz jars ~~2-16 oz~~  
1-FB in 2-Vials

NOTES: 1 — Length recovered; 0"—Loss of Sample.  
2 — U = undisturbed.  
3 — Log depth of change in color of wash water, loss of water, artesian water, sand heave in casing, etc.



ENGINEERING DEPARTMENT  
MATERIALS ENGINEERING DIVISION  
PID READINGS

2

PID Model: Mini Ka

[illegible]

# THE PORT AUTHORITY OF N.Y & N.J.

## ENGINEERING DEPARTMENT MATERIALS ENGINEERING DIVISION CHAIN OF CUSTODY RECORD

Sheet 3 of 3

PROJECT: <u>BUG Site</u>	
LOCATION: <u>laid out by H. Mott as per drawing</u>	DATE: <u>6/16/05</u>
BORING No: <u>BUG-24</u>	TOTAL No. OF SAMPLES: <u>2</u>

SIGNATURE OF ALL

PRESENT AT SAMPLING

T.R. -

RELINQUISHED DATE 6/16/05 RECEIVED

BY (SIGN) T.R. - TIME BY (SIGN)

RELINQUISHED DATE RECEIVED

BY (SIGN) TIME BY (SIGN)

RELINQUISHED DATE RECEIVED

BY (SIGN) TIME BY LAB

REMARKS: 2 Samples in 2- 16 oz jars

## THE PORT AUTHORITY OF NY &amp; NJ

Engineering Department  
Materials Engineering Division

## BORING REPORT

PROJECT				NAME OF CONTRACTOR		BORING NO.		SHEET 1 OF 3	
LOCATION				CONTRACT NO.		DATE		SURFACE ELEV.	
SPOON		CASING SIZE		HOLE TYPE		GROUND WATER LEVEL			
"O.D."		"I.D."		"HOLE TYPE"		Date	Time	Depth	Remarks
HAMMER		HAMMER		HAMMER					
# FALL		# FALL		# FALL					
DRILLER									
INSPECTOR									
PROJECT: <i>BUG - Site</i>						NAME OF CONTRACTOR: <i>Craig</i>		BORING NO.: <i>BUG-25</i>	
LOCATION: <i>As laid out by H.M. at per drawing</i>						CONTRACT NO.: <i>426-03-013</i>		DATE: <i>6/16/05</i>	
SPOON		CASING SIZE		HOLE TYPE		GROUND WATER LEVEL			
"O.D."		"I.D."		"HOLE TYPE"		Date	Time	Depth	Remarks
HAMMER		HAMMER		HAMMER					
# FALL		# FALL		# FALL					
DRILLER: <i>T. Poinchard</i>									
INSPECTOR: <i>T. Fye</i>									
						6/16/05 9:45A 4.5' In S# 10			
CASING BLOWS/FT.									
DEPTH									
SPOON BLOWS/6"									
RE- COV'D									
SAMP. NO.									
SAMPLE DESCRIPTION AND REMARKS									
LINE LOCATES CHANGE OF PROFILE (Phragmites)									
1						Fill - Br m-f Sand, little Gravel to Silt			
2						Same w/ to Cobble			
3						Same w/ to Boulders			
4						Same			
5						Same			
6						Same			
7						Same			
8						Same			
9						Same			
10						Same			
11						Bl org Clay, little Plat fibers w/ feldspar phen.			
12						Same			
13						Br m-f Sand, some silts, to clay			
Bottom of Boring						6.5'			
Note: Sample #1 (0.0'-0.5') & 11 saved for testing									
Also S# 13 saved & put on HOLD. If S# 11									
is OK then throw out S# 13.									

NOTES: 1 — Length recovered; 0" — Loss of Sample.

2 — U = undisturbed.

3 — Log depth of change in color of wash water, loss of water, artesian water, sand heave in casing, etc.

ENGINEERING DEPARTMENT  
MATERIALS ENGINEERING DIVISION  
PID READINGS

PROJECT: BAC - 500

BORING No.

FIELD READINGS BY:

DATE:

### PID Model:

[illegible]

# THE PORT AUTHORITY OF N.Y & N.J.

ENGINEERING DEPARTMENT

MATERIALS ENGINEERING DIVISION

CHAIN OF CUSTODY RECORD

Sheet 3 of 3

PROJECT: <u>BUG - Site</u>	
LOCATION: <u>As laid out by H. Matt &amp; as per drawing</u>	DATE: <u>6/16/05</u>
BORING No: <u>BUG-25</u>	TOTAL No. OF SAMPLES: <u>2 + 1 on hold.</u>

SIGNATURE OF ALL

PRESENT AT SAMPLING

T.R. -

RELINQUISHED

DATE 6/16/05 RECEIVED

BY (SIGN)

T.R. -

TIME

BY (SIGN)

RELINQUISHED

DATE

RECEIVED

BY (SIGN)

TIME

BY (SIGN)

RELINQUISHED

DATE

RECEIVED

BY (SIGN)

TIME

BY LAB

REMARKS:

2 Samples in 2 16 oz

1 Hold Sample in 1-16 oz jar

Note: Sample # 1 & 11 Will be tested -

Sample # 13 on HOLD!

SECTION 01110

SUMMARY OF WORK

SECTION TABLE OF CONTENTS

PART 1 GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

1.1.1 Project Description

1.1.2 Location

1.2 EXISTING WORK

1.3 LOCATION OF UNDERGROUND FACILITIES

1.3.1 Notification Prior to Excavation

PART 2 PRODUCTS

PART 3 EXECUTION

## PART 1 GENERAL

### 1.1 WORK COVERED BY CONTRACT DOCUMENTS

#### 1.1.1 Project Description

The project involves the restoration of 5.39 acres of inter-tidal salt marsh and 1.27 acres of maritime upland transition. Project work generally involves installation of erosion and sediment control measures, clearing, grubbing, excavation, disposal, grading, planting with native salt marsh vegetation and a 1 year maintenance period upon completion of construction and related incidental work.

Erosion and sediment control measures shall be installed at the limits of work and within Old Place Creek prior to beginning clearing, grubbing or earthwork. It is important to note that the existing wetland/upland line represents the waterward limits of work. The 6.66 acre work area shall be cleared of all standing vegetation, woody and herbaceous, and grubbed to loosen the ground surface. A 5.39 acre portion of this area shall then be excavated down to inter-tidal elevations, the excavated material is to be dewatered on-site prior to transport and then disposed of at an approved off-site location. Upon completion of excavation finish grades shall be achieved across the site and temporary stabilization measures installed. An progress/as-built topographic survey shall be provided to the District for review prior to planting. Then specified wetland and upland plant material shall be installed. The guarantee/monitoring period shall run for one year from the completion of construction. The contractor shall be responsible for any watering or material replacement during that time period.

#### 1.1.2 Location

The 6.77 acre project site is located along Old Place Creek, Richmond County, Staten Island, NY. The project area is located west of the existing Keyspan energy facility on Gulf Avenue and east of Old Place Creek. The upstream end of the project is the box culvert under Gulf Avenue at the southern end of the site. The downstream end of the project is another culvert under Gulf Avenue located at the northern end of the site (See Drawing 2). The exact site location will be shown by the Contracting Officer.

### 1.2 EXISTING WORK

In addition to "FAR 52.236-9, Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements":

- a. Remove or alter existing work in such a manner as to prevent injury or damage to any portion of the surrounding private property or of the existing work, which is to remain.
- b. Repair or replace portions of existing work, which have been altered during construction operations to match existing or adjoining work, as shown on the Contract Drawings and as approved by the Contracting Officer. At the completion of operations, existing work shall be in a condition equal to or better than that, which existed before new work started.
- c. The Contractor shall be responsible for ensuring that the existing

tidal wetlands are not adversely impacted during construction. The waterward limits of work shall be the wetland/upland line as shown on the Contract Drawings. Erosion and sediment control measures shall be installed on the upland side of this line prior to and maintained throughout the construction period.

### 1.3 LOCATION OF UNDERGROUND FACILITIES

Obtain all required building permits prior to the start of any grubbing or excavation work. Scan the construction site with electromagnetic or sonic equipment, and mark the ground surface where existing underground utilities are discovered. Verify the elevations of existing piping, utilities, and any type of underground [or encased] obstruction not specified to be removed but indicated or discovered during scanning in locations to be excavated, graded or planted. Verify elevations before installing new work closer than nearest manhole or other structure at which an adjustment in grade can be made.

#### 1.3.1 Notification Prior to Excavation

Notify NYSDEC in "Notice of Intent to Commence Work", which shall include the location of access points, haul roads and erosion controls. Contractor is responsible for completing the "Notice of Intent to Commence Work".

### PART 2 PRODUCTS

- a. Excavation Permit and any additional local approvals required prior to construction
- b. Construction Phasing Plan
- c. Proof of Materials Disposal
- d. As-built Topographic Plan
- e. Materials (plant, seed, fertilizer, etc...) Delivery Orders or Bills of Lading
- f. Soil Disposal Plan and related permits

### PART 3 EXECUTION

Not used.

-- End of Section --



SECTION 01320

PROJECT SCHEDULE

SECTION TABLE OF CONTENTS

PART 1 GENERAL

1.1 SUBMITTALS

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

3.2 BASIS FOR PAYMENT

3.3 PROJECT SCHEDULE

3.3.1 Progress Curve

3.3.2 Schedule and Progress Curve Updates

3.3.3 Periodic Project Meetings

## PART 1 GENERAL

### 1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

#### SD-01 Preconstruction Submittals

Project Schedule; G, A.

Submit within 5 days after receipt of Notice to Proceed (NTP).

#### SD-07 Certificates

Periodic Schedule Update; G, A.

Submit no later than 4 days after the Monthly Coordination Meeting.

Progress Curve; G, A.

Submit no later than 4 days after the Monthly Coordination Meeting.

Narrative Report; G, A.

Submit no later than 4 days after the Monthly Coordination Meeting.

## PART 2 PRODUCTS (NOT USED)

## PART 3 EXECUTION

### 3.1 GENERAL

Pursuant to the Contract Clause, SCHEDULE FOR CONSTRUCTION CONTRACTS, and Special Contract Requirement, SCHEDULING AND DETERMINATION OF PROGRESS, the Contractor shall prepare and submit for approval a practicable Project Schedule.

### 3.2 BASIS FOR PAYMENT

The approved Project Schedule shall be used to measure the progress of the work, to aid in evaluating time extensions, and to provide the basis of all progress payments.

### 3.3 PROJECT SCHEDULE

The Project Schedule shall be in the form of a chart consisting of a series of bars graphically indicating the sequence proposed to accomplish each work feature or operation. Each bar will represent a work feature, system or series of activities within the construction project. The chart shall be prepared to show the starting and completion dates of all work features on a linear horizontal time scale beginning with date of NTP and indicating calendar days to completion. Interdependence of status of activities shall be shown. Horizontal time scale shall allow identification of the first work day of each week, which shall be identified. Space between bars shall be allowed for future revisions and notations.

### 3.3.1 Progress Curve

As part of the Project Schedule, the Contractor shall also submit for approval a progress curve which reflects the intended schedule for completing the work. The progress curve (S-Curve) will be plotted to reflect Cumulative Progress (percent) based on placement along the y-axis and Time (days) along the x-axis.

### 3.3.2 Schedule and Progress Curve Updates

The approved schedule and progress curves will be updated monthly during the entire duration of construction. Not later than 4 days after the Monthly Coordination Meeting the Contractor shall submit a Periodic Schedule Update and progress curve. The updated versions shall include all approved Contract revisions, progress of each activity to date of submission, and adjustments. The Contractor shall also submit a very brief Narrative Reports required to indicate any problem areas, anticipated delays, impact on schedule, and corrective actions.

### 3.3.3 Periodic Project Meetings

Progress meetings to discuss payment shall include a monthly on-site meeting or other regular intervals mutually agreed to at the Pre-construction Conference. During this meeting the Contractor shall describe, on an activity by activity basis, all proposed revisions and adjustments to the Project Schedule required to reflect the current status of the Project. The Contracting Officer will approve activity progress, proposed revisions, and adjustments as appropriate.

-- End of Section --

SECTION 01330

SUBMITTAL PROCEDURES

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PART 1 GENERAL

- 1.1 SUMMARY
- 1.2 SUBMITTAL IDENTIFICATION
- 1.3 SUBMITTAL CLASSIFICATION
  - 1.3.1 Government Approved
  - 1.3.2 Information Only
  - 1.3.3 Reviewer Codes
- 1.4 APPROVED SUBMITTALS
- 1.5 DISAPPROVED SUBMITTALS
- 1.6 WITHHOLDING PAYMENT
- 1.7 SUBMITTALS

PART 2 (NOT USED)

PART 3 EXECUTION

- 3.1 GENERAL
- 3.2 SUBMITTAL REGISTER (ENG FORM 4288)
- 3.3 SCHEDULING
- 3.4 TRANSMITTAL FORM (ENG FORM 4025)
- 3.5 SUBMITTAL PROCEDURE
  - 3.5.1 Procedures
  - 3.5.2 Deviations
- 3.6 CONTROL OF SUBMITTALS
- 3.7 GOVERNMENT APPROVED SUBMITTALS
- 3.8 INFORMATION ONLY SUBMITTALS

## PART 1 GENERAL

## 1.1 SUMMARY

This section covers procedures to be used in making submittals called for in the contract documents. In contracts which contain specific Contractor Quality Control (CQC) requirements, the Contractor's Quality Control System Manager shall carry out duties associated with submittal procedures. In contracts which do not contain specific CQC requirements, reference to "CQC System Manager" shall be interpreted as reference to the Contractor's authorized representative, and references to "CQC Requirements" or "CQC Clauses" shall be interpreted as "requirements or clauses elsewhere in the contract."

## 1.2 SUBMITTAL IDENTIFICATION

Submittals required are identified by SD numbers as follows:

## SD-01 Pre-construction Submittals

A document, required of the Contractor, or through the Contractor, from a supplier, installer, manufacturer, or other lower tier Contractor, the purpose of which is to confirm the quality or orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel, qualifications, or other verifications of quality.

Certificates of insurance.  
Surety bonds.  
List of proposed subcontractors.  
List of proposed products.  
Construction Progress Schedule.  
Submittal register.  
Schedule of prices.  
Accident Prevention plan.  
Work plan.  
Quality control plan.  
Environmental protection plan.

## SD-02 Drawings

Sumittals which graphically show relationship of various components of the work, schematic diagrams of systems, details of fabrication, layouts of particular elements, connections, and other relational aspects of the work.

## SD-03 Product Data

Preprinted manufacturer material describing a product, system, or material, such as catalog cuts.

## SD-04 Samples

Samples, including both fabricated and un-fabricated physical examples of materials, products, and units of work as complete units or as portions of units of work.

## SD-05 Design Data

Submittals, which provide calculations, descriptions, or documentation regarding the work.

#### SD-06 Test Reports

Reports of inspections or tests, including analysis and interpretation of test results.

Investigation reports.

Daily checklists.

Final acceptance test and operational test procedure.

#### SD-07 Certificates

Statement signed by an official authorized to certify on behalf of the manufacturer of a product, system or material, attesting that the product, system or material meets specified requirements. The statement must be dated after the award of the contract, must state the Contractor's name and address, must name the project and location, and must list the specific requirements, which are being certified.

Document required of Contractor, or of a supplier, installer or subcontractor through Contractor, the purpose of which is to further quality of orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel qualifications.

#### SD-08 Manufacturer's Instructions

Preprinted material describing installation of a product, system or material; including special notices and material safety data sheets, if any, concerning impedances, hazards, and safety precautions.

#### SD-09 Manufacturer's Field Reports

Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

Factory test reports.

#### SD-10 Operation and Maintenance Data

Data, which forms a part of an operation and maintenance manual.

#### SD-11 Closeout Submittals

All data, documentations, information, and drawings to achieve contract closeout.

#### SD-12 Schedules

#### SD-13 Records

Documentation to record compliance with technical or administrative requirements.

### 1.3 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

#### 1.3.1 Government Approved

Governmental approval is required for extensions of design, critical materials, deviations, equipment whose compatibility with the entire system must be checked, and other items as designated by the Contracting Officer. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction," they are considered to be "shop drawings."

#### 1.3.2 Information Only

All submittals not requiring Government approval will be for information only. They are not considered to be "shop drawings" within the terms of the Contract Clause referred to above.

#### 1.3.3 Reviewer Codes

Reviewer codes on the Submittal Register (ENG Form 4288) are identified as follows:

- A - Area Engineer
- E - Engineering Division (Design Branch)
- COR - Contracting Officer's Representative

### 1.4 APPROVED SUBMITTALS

The Contracting Officer's approval of submittals shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing and other information are satisfactory. Approval will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the CQC requirements of this contract is responsible for dimensions, the design of adequate connections and details, and the satisfactory construction of all work. After submittals have been approved by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

### 1.5 DISAPPROVED SUBMITTALS

The Contractor shall make all corrections required by the Contracting Officer and promptly furnish a corrected submittal in the form and number of copies specified for the initial submittal. If the Contractor considers any correction indicated on the submittals to constitute a change to the contract, a notice in accordance with the Contract Clause "Changes" shall be given promptly to the Contracting Officer.

### 1.6 WITHHOLDING OF PAYMENT

Payment for materials incorporated in the work will not be made if required approvals have not been obtained.

### 1.7 SUBMITTALS

Government approval is required for submittals with a "G" designation;

submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

ENG FORM 4288; G, A.

Submit to the Contracting Officer for approval within 30 calendar days after Notice to Proceed; 15 days if construction time is 180 days or less.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

The Contractor shall make submittals as required by the specifications. The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections. Units of weights and measures used on all submittals shall be the same as those used in the contract drawings. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Prior to submittal, all items shall be checked and approved by the CQC System Manager and each item shall be stamped, signed, and dated by the CQC System Manager indicating action taken. Proposed deviations from the contract requirements shall be clearly identified. Submittals shall include items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves; test reports; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required submittals. Submittals requiring Government approval shall be scheduled and made prior to the acquisition of the material or equipment covered thereby. Samples remaining upon completion of the work shall be picked up and disposed of in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.

3.2 SUBMITTAL REGISTER (ENG FORM 4288)

ENG Form 4288 is presented at the end of this section, listing items of equipment and materials for which submittals are required by the specifications; this list may not be all inclusive and additional submittals may be required. Columns "d" through "r" have been completed by the Government; the Contractor shall complete columns "a" and "s" through "u" and submit the forms (hard copy plus associated electronic file) to the Contracting Officer for approval within 30 calendar days after Notice to Proceed (15 days if construction time is 180 days or less). If the Government supplies the ENG Form 4288 on the Resident Management System (RMS) electronic format, the Contractor shall be required to process and update the 4288 electronically, and make appropriate electronic submissions to the Government. Otherwise, the Contractor shall be given the submittal register as a diskette containing the computerized ENG Form 4288 and instructions on the use of the diskette. In both cases, the Contractor shall update the 4288 electronically, and shall submit it to the Government together with the monthly payment request. The approved submittal register will become the scheduling document and will be used to control submittals



throughout the life of the contract. The submittal register and the progress schedules shall be coordinated.

### 3.3 SCHEDULING

Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted concurrently. Certifications to be submitted with the pertinent drawings shall be so scheduled. Adequate time (a minimum of 30 calendar days exclusive of mailing time but not more than 45 calendar days) shall be allowed and shown on the register for review and approval. No delay damages or time extensions will be allowed for time lost in late submittals.

### 3.4 TRANSMITTAL FORM (ENG FORM 4025)

The sample transmittal form (ENG Form 4025) attached to this section shall be used for submitting both Government approved and information only submittals in accordance with the instructions on the reverse side of the form. These forms will be furnished to the Contractor. This form shall be properly completed by filling out all the heading blank spaces and identifying each item submitted. Special care shall be exercised to ensure proper listing of the specification paragraph and/or sheet number of the contract drawings pertinent to the data submitted for each item. If the contractor is required in another section of the specifications to utilize the RMS system, the Contractor shall be required to generate and process this form electronically using the RMS system.

### 3.5 SUBMITTAL PROCEDURE

Submittals shall be made as follows:

#### 3.5.1 Procedures

At the Pre-construction conference, the Contractor shall ascertain the name and address of each individual, agency, or firm who is designated to normally receive items for approval, information or samples. The Contractor shall complete ENG Form 4025, entering each item requiring a separate approval action as a separate item on the form, for each transmittal. A transmittal may consist of one or more 4025 sheets. The transmittal, consisting of ENG Form 4025 plus all applicable submittals, will then be sent to the appropriate individual. On critical items the Contractor shall confirm receipt via telephone. The Contractor shall submit seven (7) copies of submittals for approval and one (1) copy for items for information only.

Within 30 days of receiving the Notice to Proceed, the Contractor shall provide a complete listing of planting materials and the nursery from which they were acquired to the Contracting Officer for review. If the planting list is determined to be deficient, additional information shall be provided. Within 10 days after approval, the Contractor shall forward draft purchase orders for all specified plant materials. Only after receiving written approval of the genetic origin of the source material, shall the Contractor proceed with procurement. The Contractor shall furnish complete information as to the location of all plants, from which he intends to supply. The Contracting Officer reserves the right to inspect, tag (seal) and approve all plants at the source of supply.

### 3.5.2 Deviations

For submittals which include proposed deviations requested by the Contractor, the column "variation" of ENG Form 4025 shall be checked. The Contractor shall set forth in writing the reason for any deviations and annotate such deviations on the submittal. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted deviations.

### 3.6 CONTROL OF SUBMITTALS

The Contractor shall carefully control its procurement operations to ensure that each individual submittal is made on or before the Contractor's scheduled submittal date shown on the approved "Submittal Register."

### 3.7 GOVERNMENT APPROVED SUBMITTALS

Upon completion of review of submittals requiring Government approval, the submittals will be identified as having received approval by being so stamped and dated. Four copies of the submittal will be retained by the Contracting Officer and three copies of the submittal will be returned to the Contractor.

### 3.8 INFORMATION ONLY SUBMITTALS

Normally, submittals for information only will not be returned. Approval of the Contracting Officer is not required on information-only submittals.

The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work; and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe.

## 3.9 STAMPS

Stamps used by the Contractor on the submittal data to certify that the submittal meets contract requirements shall be similar to the following:

<p>CONTRACTOR</p> <p>(Firm Name)</p> <p>_____ Approved</p> <p>_____ Approved with corrections as noted on submittal data and/or attached sheets(s).</p> <p>SIGNATURE: _____</p> <p>TITLE: _____</p> <p>DATE: _____</p>
--

-- End of Section --

01330 - 9

TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE <small>(Read instructions on the reverse side prior to initiating this form)</small>					DATE		TRANSMITTAL NO.	
<b>SECTION 1 - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS</b> <small>(This section will be initiated by the contractor)</small>								
TO:			FROM:		CONTRACT NO.		CHECK ONE: <input type="checkbox"/> THIS IS A NEW TRANSMITTAL <input type="checkbox"/> THIS IS A RESUBMITTAL OF TRANSMITTAL	
SPECIFICATION SEC. NC <small>(Cover only one section with each transmittal)</small>			PROJECT TITLE AND LOCATION				CHECK ONE: THIS TRANSMITTAL IS FOR <input type="checkbox"/> FIO <input type="checkbox"/> GOV'T APPROVAL	
ITEM NO.	DESCRIPTION OF ITEM SUBMITTED <small>(Type size, model number/etc.)</small>	MFG OR COTRA. CAT., CURVE DRAWINGS OR BROCHURE NO. <small>(See instruction no. 8)</small>	NO. OF COPIES	CONTRACT REFERENCE DOCUMENT		FOR CONTRACTOR USE CODE	VARIATION <small>(See instruction No.6)</small>	FOR CE USE CODE
				SPEC. PARA. NO.	DRAWING SHEET NO.			
a.	b.	c.	d.	e.	f.	g.	h.	i.
REMARKS				I certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as other wise stated.				
				NAME AND SIGNATURE OF CONTRACTOR				
<b>SECTION II - APPROVAL ACTION</b>								
ENCLOSURE RETURNED <small>(List by Item No.)</small>			NAME, TITLE AND SIGNATURE OF APPROVING AUTHORITY				DATE	

## INSTRUCTIONS

1. Section I will be initiated by the Contractor in the required number of copies.
2. Each transmittal shall be numbered consecutively in the space provided for "Transmittal No.". This number, in addition to the contract number, will form a serial number for identifying each submittal. For new submittals or resubmittals mark the appropriate box; on resubmittals, insert transmittal number of last submittal as well as the new submittal number.
3. The "Item No." will be the same "Item No." as indicated on ENG FORM 4288-R for each entry on this form.
4. Submittals requiring expeditious handling will be submitted on a separate form.
5. Separate transmittal form will be used for submittal under separate sections of the specifications.
6. A check shall be placed in the "Variation" column when a submittal is not in accordance with the plans and specifications--also, a written statement to that effect shall be included in the space provided for "Remarks".
7. Form is self-transmittal, letter of transmittal is not required.
8. When a sample of material or Manufacturer's Certificate of Compliance is transmitted, indicate "Sample" or "Certificate" in column c, Section I.
9. U.S. Army Corps of Engineers approving authority will assign action codes as indicated below in space provided in Section I, column i to each item submitted. In addition they will ensure enclosures are indicated and attached to the form prior to return to the contractor. The Contractor will assign action codes as indicated in Section I, column g, to each item submitted.

### THE FOLLOWING ACTION CODES ARE GIVEN TO ITEMS SUBMITTED

- |   |   |
|---|---|
| A -- Approved as submitted  | E -- Disapproved (See attached).  |
| B -- Approved, except as noted on drawings.   | F -- Receipt acknowledged.  |
| C -- Approved, except as noted on drawings.<br>Refer to attached sheet resubmission required. | FX -- Receipt acknowledged, does not comply<br>as noted with contract requirements. |
| D -- Will be returned by separate correspondence.   | G -- Other (Specify)  |
10. Approval of items does not relieve the contractor from complying with all the requirements of the contract plans and specifications.

## **Brooklyn Union Gas (BUG) Site Salt Marsh Mitigation Project**

Relative to the “REVIEWER” column of ENG Form 4288  
The following codes apply:

E – ENGINEERING DIVISION

A – AREA ENGINEER

AE – ARCHITECT ENGINEER

COR – CONTRACTING OFFICER’S REPRESENTATIVE

(ER 415-1-10)

**SPECIFICATION  
SECTION  
01320**

CONTRACTOR
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[illegible]

01330-12

(ER 415-1-10)

**SPECIFICATION**  
**SECTION 01420**

CONTRACTOR

01330-13



# SUBMITTAL REGISTER

(ER 415-1-10)

# SUBMITTAL REGISTER

(ER 415-1-10)

CONTRACT NO.

TITLE AND LOCATION: **BROOKLYN UNION GAS (BUG) SITE SALT MARSH MITIGATION PROJECT**

CONTRACTOR	
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SPECIFICATION  
SECTION  
01451

[illegible]

01330-14

(ER 415-1-10)

**SPECIFICATION  
SECTION  
01553**

CONTRACTOR

01330-15

(ER 415-1-10)

**SPECIFICATION  
SECTION  
02230**

CONTRACTOR

01330-16

(ER 415-1-10)

SPECIFICATION  
SECTION  
02232

CONTRACTOR
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01330-17

# SUBMITTAL REGISTER

(ER 415-1-10)

TITLE AND LOCATION: **BROOKLYN UNION GAS (BUG) SITE SALT MARSH MITIGATION PROJECT**

CONTRACTOR
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SPECIFICATION  
SECTION  
02233

[illegible]

# SUBMITTAL REGISTER

(ER 415-1-10)

# SUBMITTAL REGISTER

(ER 415-1-10)

CONTRACT NO.

TITLE AND LOCATION: **BROOKLYN UNION GAS (BUG) SITE SALT MARSH MITIGATION PROJECT**

CONTRACTOR

**SPECIFICATION  
SECTION  
02234**

[illegible]

01330-19

# SUBMITTAL REGISTER

(ER 415-1-10)

# SUBMITTAL REGISTER

(ER 415-1-10)

CONTRACT NO.

TITLE AND LOCATION: **BROOKLYN UNION GAS (BUG) SITE SALT MARSH MITIGATION PROJECT**

CONTRACTOR

SPECIFICATION  
SECTION  
02235

[illegible]

01330-20

# SUBMITTAL REGISTER

(ER 415-1-10)

# SUBMITTAL REGISTER

(ER 415-1-10)

# SUBMITTAL REGISTER

(ER 415-1-10)

TITLE AND LOCATION: **BROOKLYN UNION GAS (BUG) SITE SALT MARSH MITIGATION PROJECT**

CONTRACTOR
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SPECIFICATION  
SECTION  
02236

[illegible]

01330-21



01330-22

SUBMITTAL REGISTER																				CONTRACT NO.						
TITLE AND LOCATION: BROOKLYN UNION GAS (BUG) SITE SALT MARSH MITIGATION PROJECT																				CONTRACTOR		SPECIFICATION SECTION 02237				
ACTIVITY NO	TRANSMITTAL NO.	ITEM NO.	SPECIFICATION PARAGRAPH NUMBER	DESCRIPTION OF ITEM SUBMITTED	TYPE OF SUBMITTAL										CLASSIFICATION		REVIEWER	CONTRACTOR SCHEDULE DATES			CONTRACTOR ACTION			GOVERNMENT ACTION		REMARKS
					DATA	DRUGS	INSTRUCTIONS	STATEMENTS	REPORTS	CERTIFICATES	SAMPLES	RECORDS	MANUALS	INFORMATION ONLY	GOVERNMENT APPROVED	CODE		DATE	SUBMIT TO GOVERNMENT	CODE	DATE					
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.	l.	m.	n.	o.	p.	q.	r.	s.	t.	u.	v.	w.	x.	y.	z.	aa.
			1.3	PLANT MATERIAL ORDER	X											X	A, COR									
			1.3	PLANT MATERIAL DATA SHEETS	X											X	A, COR									
			1.3	SOIL AMENDMENT DATA SHEETS	X											X	A, COR									
			1.3	MULCH DATA SHEETS	X											X	A, COR									
			1.3	PESTICIDE AND HERBICIDE DATA SHEETS	X											X	A, COR									
			1.3	DELIVERY SCHEDULE				X								X	A, COR									
			1.3	EQUIPMENT	X											X	A, COR									
			1.3	FINISHED GRADE AND CLEAN SAND						X						X	A, COR									
			1.3	SOIL AMENDMENT SAMPLE								X				X	A, COR									
			1.3	EQUIPMENT CALIBRATION REPORT						X						X	A, COR									
			1.3	SOILS TEST						X						X	A, COR									
			1.3	SOIL AMENDMENTS TESTING						X						X	A, COR									
			1.3	ONE-YEAR PLANT GUARANTEE								X				X	A, COR									
			1.3	TESTING LABORATORY QUALS								X				X	A, COR									
			1.3	HERBICIDE/PESTICIDE TREATMENT PLAN				X		X						X	A, COR									
			1.3	MAINTENANCE RECORD	X					X						X	A, COR									

(ER 415-1-10)

SPECIFICATION  
SECTION  
02379

CONTRACTOR

01330-23

(ER 415-1-10)

CONTRACT NO.

TITLE AND LOCATION: **BROOKLYN UNION GAS (BUG) SITE SALT MARSH MITIGATION PROJECT**

CONTRACTOR

SPECIFICATION  
SECTION  
02380

[illegible]

01330-24

(ER 415-1-10)

CONTRACT NO.

TITLE AND LOCATION: **BROOKLYN UNION GAS (BUG) SITE SALT MARSH MITIGATION PROJECT**

CONTRACTOR

SPECIFICATION  
SECTION  
02731

[illegible]

01330-25

## SUBMITTAL REGISTER

## SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION: **BROOKLYN UNION GAS (BUG) SITE SALT MARSH MITIGATION PROJECT**

CONTRACTOR
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SPECIFICATION  
SECTION  
02821

[illegible]

01330-26

SECTION 01551

SITE CLEARING FOR STAGING AREA

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PART 1 GENERAL

1.1 SCOPE OF WORK

1.2 MEASUREMENT AND PAYMENT

1.2.1 Payment Item No. 0002 Site Clearing for Staging Area

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 METHOD

3.1.1 Site Clearing

3.1.2 Tree Protection

## PART 1 GENERAL

### 1.1 SCOPE OF WORK

Under this item the Contractor shall clear and remove all objectionable material such as trees up to and including six (6) inches in caliper, all shrubby growth and brush, vines, stumps of all sizes, and weeds, stones, wood and all trash including but not limited to tires, timber and glass within the limits shown on the plans, in accordance with these specifications and the direction of the Contracting Officer.

Trees, shrubs and other growth to remain shall be marked in the field by the Contracting Officer or the Contracting Officer's Representative. The Contractor shall carefully protect all trees, shrubs and other growth to remain and shall also be liable for any and all damages to adjacent property caused by clearing operations. All damaged trees and plants, in the equipment staging area shall be replaced or restored to their original condition to the satisfaction of the Contracting Officer.

This item shall be used for clearing of the equipment staging area and the construction entrance only. Clearing within the contract limits of the planned wetlands area shall be paid for under the item "Clearing and Grubbing".

### 1.2 MEASUREMENT AND PAYMENT

#### 1.2.1 Payment Item No. 0002 Site Clearing for Staging Area

For performing the work SITE CLEARING under this item, in accordance with the Contract Drawings, specifications and directions of the Contracting Officer, the Contractor shall receive the LUMP SUM price bid.

The price bid shall be a LUMP SUM and shall include the cost of all labor, materials and equipment necessary for clearing all objectionable material within the limits of the contract, and all work incidental thereto, in accordance with the plans and specifications, to the satisfaction of the Contracting Officer. The LUMP SUM price bid shall include the removal, hauling, and disposal of tires and trash.

## PART 2 PRODUCTS

### 2.1 MATERIALS

Construction fencing: Construction fencing shall conform to the products requirements described in Section 02821 FENCING.

#### 2.1.1 Tree Protection Materials

Pruning equipment: Shears, saws or other equipment for removing tree branches.

## PART 3 EXECUTION

### 3.1 METHOD

#### 3.1.1 Site Clearing

Unless otherwise directed, the Contractor shall thoroughly clear and remove all objectionable surface material. Whenever possible, the Contractor shall separate organic debris from soil material.

When directed, objectionable embedded subsurface material, as heretofore described, shall be removed.

All cleared material and all other debris shall be disposed of off-site in accordance with the plans, specifications and direction of the Engineer.

### 3.1.2 Tree Protection

The Contractor shall protect existing trees marked to be preserved on the plans during the life of this Contract using the following methods.

1. For protection from construction equipment, the Contractor shall install construction fencing around the trees marked for preservation. The construction fencing shall be placed far enough away from trees, i.e. not less than the dripline of the tree or the perimeter of the canopy, so that tall equipment does not contact tree branches.
2. The Contractor shall limit soil placement over existing tree roots to a maximum of 3 inches.
3. The Contractor shall not do any work within the boundaries of the construction fencing.
4. The Contractor shall avoid spills of oil, gas, and other contaminants in the vicinity of the trees marked for preservation.
5. If damage to protected trees occurs under this Contract, the Contractor shall repair any damage to the crown, trunk, or root system immediately. If the damage causes the death of a tree marked to be preserved, the Contractor shall replace the tree to the satisfaction of the Contracting Officer at no additional cost to the Government. If repairs are necessary, they shall be made as follows and to the satisfaction of the Contracting Officer:
  - a. Roots shall be repaired by cutting off the damaged areas. Tree roots that must be severed should be cut clean. The Contractor shall spread moist top soil over exposed roots at a minimum depth of 3 inches.
  - b. Damage to bark shall be repaired by trimming around the damaged area and tapering the cut to provide drainage.
  - c. Broken branches shall be pruned using pruning equipment listed and approved by the Contracting Officer. The branch collar on all branches whether living or dead should not be damaged. The 3 cut method shall be used on all branches between 2 to 6 inches in diameter at the cut. The 3 cut method is as follows: First, cut about one-third the way through the underside of the limb (about 6 to 12 inches from the tree trunk). Approximately 1 inch further from the tree trunk, make a second cut through the entire limb from the upper side and remove the branch. Lastly, remove the remaining stub. The 4 cut method shall be used if the branch is larger than 6 inches in diameter. For the 4 cut method, cuts 1 and 2 remain the same as the 3 cut



system. Cut 3 should be from the underside of the limb, on the outside of the branch collar, and should be one-fourth to one-third the way through the limb. Cut 4 should be from the top and in alignment with the third cut.

6. During dry periods, the Contractor shall moisten the root zone of stressed trees. The water shall be allowed to soak in 12 to 18 inches deep by applying a slow trickle throughout the spread of the tree's roots.
7. Subsequent to completion of all site clearing and earthwork activities and prior to the commencement of seeding operations, the Contractor shall remove construction fencing from around the preserved trees at the direction of the Contracting Officer. Fencing shall become the property of the Contractor and shall be removed from the Project Site and disposed of off-site.

-- End of Section --

SECTION 01552

TEMPORARY CONSTRUCTION FACILITIES

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- 1.1 GENERAL REQUIREMENTS
  - 1.1.1 Site Plan
  - 1.1.2 Employee Parking
- 1.2 MEASUREMENT AND PAYMENT
- 1.3 AVAILABILITY AND USE OF UTILITY SERVICES
  - 1.3.1 Meters and Temporary Connections
  - 1.3.2 Temporary Water (where needed)
  - 1.3.4 Sanitation
  - 1.3.4 Telephone
- 1.4 BULLETIN BOARD, PROJECT SIGN, AND PROJECT SAFETY SIGN
  - 1.4.1 Bulletin Board
  - 1.4.2 Project and Safety Signs
- 1.5 PROTECTION AND MAINTENANCE OF TRAFFIC
  - 1.5.1 Haul Roads
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- 1.6 CONTRACTOR'S TEMPORARY FACILITIES
  - 1.6.1 Administrative Field Offices
  - 1.6.2 Storage Area
  - 1.6.3 Appearance of Trailers
  - 1.6.4 Maintenance of Storage Area
  - 1.6.5 Security Provisions
- 1.7 CLEANUP
- 1.8 RESTORATION OF STORAGE AREA

## PART 1.1 GENERAL

### 1.1.1 Site Plan

Under this section, the work shall consist of the installation, maintenance, and removal of temporary construction facilities, in accordance with the plans and specifications, and as directed by the Contracting Officer.

The Contractor shall prepare a site plan indicating the location and dimensions of any area to be fenced and used by the Contractor, the number of trailers to be used, avenues of ingress/egress to the fenced area and details of the fence installation. Any areas which may have to be graveled to prevent the tracking of mud shall also be identified. The Contractor shall also indicate if the use of a supplemental or other staging area is desired.

### 1.1.2 Employee Parking

Contractor employees shall park privately owned vehicles in an area designated by the Contracting Officer. This area will be within reasonable walking distance of the construction site.

## 1.2 MEASUREMENT AND PAYMENT

Payment for work under this section shall be made under Payment Item No. 0001 Mobilization and Demobilization, which is described in Section 01550 Mobilization.

## 1.3 AVAILABILITY AND USE OF UTILITY SERVICES

### 1.3.1 Meters and Temporary Connections

The Contractor shall provide and maintain all electrical power required in connection with the Contractor's operations. The Contractor shall pay for all charges, costs and expenses incidental to the extension and maintenance of electric power as required in connection with the Contractor's operations, and the Contractor shall pay for all power used for the Contract period. Upon completion of the project period the electric service shall be removed.

### 1.3.2 Temporary Water (where needed)

If needed during the construction phase, the Contractor shall furnish and pay for water used for temporary service as described herein, shall make all arrangements for such water with the agency having jurisdiction and shall provide special metering and piping if required; shall provide and pay for all connections and permits; shall protect lines against any damage. NOTE: A hydrant exists near the construction entrance. The Contractor shall determine if this hydrant can provide his water needs, as no such guarantee is provided by the USACE. No extra monies shall be paid by the USACE for any water service issue arising.

### 1.3.3 Sanitation

The Contractor shall provide and maintain toilet accommodations for all persons employed or engaged in the work; such facilities shall meet any and all requirements of law, rule or regulation. The Contractor shall remove such facilities at the completion of the work or at such earlier time as the USACE's Representative may direct.

#### 1.3.4 Telephone

The Contractor shall make arrangements and pay all costs for telephone facilities desired.

### 1.4 BULLETIN BOARD, PROJECT SIGN, AND PROJECT SAFETY SIGN

#### 1.4.1 Bulletin Board

Immediately upon beginning of work, the Contractor shall provide a weatherproof glass-covered bulletin board not less than 915 by 1220 mm 36 by 48 inches in size for displaying the Equal Employment Opportunity poster, a copy of the wage decision contained in the contract, Wage Rate Information poster, and other information approved by the Contracting Officer. The bulletin board shall be located at the project site in a conspicuous place easily accessible to all employees, as approved by the Contracting Officer. Legible copies of the aforementioned data shall be displayed until work is completed. Upon completion of work the bulletin board shall be removed by and remain the property of the Contractor.

#### 1.4.2 Project and Safety Signs

The Project and Safety Signs shall be erected in accordance with Section 01525 SAFETY. The signs shall be erected within 1 calendar day after commencement of work. The information displayed shall be in accordance with Section 01420 SAFETY and shall be in clear view of the on-site construction personnel, maintained current, and protected against the elements and unauthorized removal.

### 1.5 PROTECTION AND MAINTENANCE OF TRAFFIC

#### 1.5.1 Haul Roads

The Contractor shall, at his own expense, design, construct access and haul roads necessary for proper execution of the work under this contract. The Contractor shall remove select sections of existing fencing along Gulf Avenue and install roll gates as indicated in Section 02821 FENCING and shown in the Contract Drawings [refer to sheet CP-1]. Haul roads shall be constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided. The Contractor shall provide necessary lighting, signs, barricades, and distinctive markings for the safe movement of traffic. The method of dust control, although optional, shall be adequate to ensure safe operation at all times. Location, grade, width, and alignment of construction and hauling roads shall be subject to approval by the Contracting Officer. Lighting shall be adequate to assure full and clear visibility for the full width of the haul road and work areas during any night work operations. Upon completion of the work, haul roads designated by the Contracting Officer shall be removed. The haul road shall be removed prior to seeding, placing erosion control blanket and vegetative plantings within the planned wetland area.

#### 1.5.2 Barricades

The Contractor shall erect and maintain temporary barricades to limit public access to hazardous areas. Such barricades shall be required whenever safe public access to paved areas such as roads, parking areas or sidewalks is prevented by construction activities or as otherwise necessary to ensure the safety of both pedestrian and vehicular traffic. Barricades

shall be securely placed, clearly visible with adequate illumination to provide sufficient visual warning of the hazard during both day and night.

#### 1.6 CONTRACTOR'S TEMPORARY FACILITIES

##### 1.6.1 Administrative Field Offices

The Contractor shall provide and maintain administrative field office facilities within the construction area at the designated site. The Contractor shall provide an office trailer to be located in an area designated by the Contracting Officer. This trailer shall measure at least 300 sq ft and shall be for the purposes of accommodating the Contractor's superintendent, meetings, and the USACE's representative. The Contractor shall remove the temporary field office at job completion.

##### 1.6.2 Storage Area

The Contractor shall construct a temporary chain link fence around trailers and materials as directed by the Contracting Officer and in accordance with Section 02821 FENCING. Trailers, materials, or equipment shall not be placed or stored outside the fenced area unless such trailers, materials, or equipment are assigned a separate and distinct storage area by the Contracting Officer.

##### 1.6.3 Appearance of Trailers

Trailers utilized by the Contractor for administrative or material storage purposes shall present a clean and neat exterior appearance and shall be in a state of good repair. Trailers which, in the opinion of the Contracting Officer, require exterior painting or maintenance will not be allowed on site.

##### 1.6.4 Maintenance of Storage Area

Fencing and other barrier controls as shown on the contract drawings shall be kept in a state of good repair and proper alignment. Should the Contractor elect to traverse, with construction equipment or other vehicles, grassed or unpaved areas which are not established roadways, such areas shall be covered with a layer of gravel or other means as approved by the Contracting Officer or the Contracting Officer's Representative, as necessary to prevent rutting and the tracking of mud onto paved or established roadways; gravel gradation shall be at the Contractor's discretion. Grass located within the boundaries of the construction site shall be mowed for the duration of the project. Grass and vegetation along fences, buildings, under trailers, and in areas not accessible to mowers shall be edged or trimmed neatly in accordance with these specifications or as directed by the Contracting Officer.

##### 1.6.5 Security Provisions

Adequate outside security lighting shall be provided at the Contractor's temporary facilities. The Contractor shall be responsible for the security of his own equipment; in addition, the Contractor shall notify the appropriate law enforcement agency requesting periodic security checks of the temporary project field office.

#### 1.7 CLEANUP

Construction debris, waste materials, packaging material and the like shall be removed from the work site daily. Any dirt or mud which is tracked onto paved or surfaced roadways shall be cleaned away. Materials resulting from

demolition activities which are salvageable shall be stored within the fenced area described above or at the supplemental storage area. Stored material not in trailers, whether new or salvaged, shall be neatly stacked when stored.

#### 1.8 RESTORATION OF STORAGE AREA

Upon completion of the project and after removal of trailers, materials, and equipment from within the fenced area, the fence shall be removed and will become the property of the Contractor. Areas used by the Contractor for the storage of equipment or material, or other use, shall be restored to the original or better condition. Gravel used to traverse grassed areas shall be removed and the area restored to its original condition, including top soil, seeding and planting as necessary.

-- End of Section --

SECTION 01553

SOIL EROSION AND SEDIMENT CONTROL

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    - 1.2.1.1 Payment Item No. 0003A Temporary Seed
    - 1.2.1.2 Payment Item No. 0003B Sediment Traps
    - 1.2.1.3 Payment Item No. 0003C Erosion Control Blankets
- 1.3 SUBMITTALS
- 1.4 DESCRIPTION OF WORK
- 1.5 DELIVERY, INSPECTION, STORAGE, AND HANDLING
- 1.6 SUBSTITUTIONS
- 1.7 WARRANTY

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- 2.3 EROSION CONTROL BLANKETS

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  - 3.3.4 Silt Fence
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    - 3.5.1.4 Silt Fence
- 3.6 FENCE REMOVAL
- 3.7 RE-USE OF FENCE MATERIALS

## PART 1 GENERAL

## 1.1 SCOPE OF WORK

This item shall consist of the supply, installation and maintenance of temporary Erosion and Sediment Control measures as shown on the Contract Drawings and as directed by the Contracting Officer. The furnishing and installation of temporary seed, hay bales, and erosion control blankets are included in this item. This Section shall be coordinated with Section 02234 SILT FENCE and Section 02235 FLOATING TURBIDITY BARRIERS as well as the permanent soil erosion and sediment control features specified throughout the contract documents.

The Contractor shall carefully protect all preserved areas as marked in the field by the Contracting Officer or the Contracting Officer's Representative, and shall also be liable for any and all damage to property caused by the work under this section. Any damages to property or to vegetation within preserved areas shall be restored to the original conditions to the satisfaction of the Contracting Officer.

## 1.2 MEASUREMENT AND PAYMENT

## 1.2.1 Payment Item: Soil Erosion and Sediment Control

The unit price bid shall include the cost of furnishing all labor, materials and equipment necessary to satisfactorily complete the work in accordance with the Contract Drawings and specifications, and to the satisfaction of the Contracting Officer.

Relocation of the temporary Soil Erosion Control device(s) from one location to another as directed by the Contracting Officer shall be considered as a new location and shall be paid separately.

After the Contracting Officer determines that the Soil Erosion and Sediment Control measures have been satisfactorily installed, seventy-five (75) percent of the price bid shall be paid. The remaining twenty-five (25) percent shall be paid after the temporary Soil Erosion and Sediment Control measure(s) have been satisfactorily removed and any disturbed vegetation replaced. However, any unit or length not properly maintained to the satisfaction of the Contracting Officer during the life of the Contract, will be deducted from the final payment on a pro-rated basis.

## 1.2.1.1 Payment Item No. 0003A Temporary Seed

This item will be measured as the number of ACRES, measured to the nearest tenth of an acre of area seeded with Temporary Seed Mix. Potential planting areas to be temporarily seeded are labeled as maritime uplands on the contract drawings. Measurement shall be based on the Contract Drawings and actual field measurements of areas seeded.

## 1.2.1.2 Payment Item No. 0003B Sediment Traps

Sediment Traps will be measured as the number of LINEAR FEET of Sediment traps erected, measured along the top of the actual hay bales, in accordance with plans and specifications, and to the satisfaction of the Contracting Officer. The unit price bid per LINEAR FOOT shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily



complete the work under this item in accordance with the plans and specifications, and to the satisfaction of the Contracting Officer.

#### 1.2.1.3 Payment Item No. 0003C Erosion Control Blankets

This item shall be measured by the SQUARE YARD of surface area covered. No measurement for payment shall be made for fine grading, trenching or other miscellaneous materials necessary for placement of the erosion control blankets.

### 1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

#### SD-01 Pre-construction Submittals

##### Stormwater Pollution Prevention Plan

Submit within 30 days prior to commencement of earthwork and construction a Stormwater Pollution Prevention Plan for inclusion in State Pollution Discharge Elimination System permit application. Contractor is responsible for obtaining State Pollution discharge elimination system permit.

### 1.4 DESCRIPTION OF WORK

The work shall consist of furnishing and installing soil surface erosion control materials fine grading, blanketing, stapling, mulching and miscellaneous related work, within project limits and in areas outside the project limits where the soil surface is disturbed from work under this contract at the designated locations. This work shall include all necessary materials, labor, supervision and equipment for installation of a complete system. This section shall be coordinated with the requirements of Section 02233 EARTHWORK, Section 02234 SILT FENCE, Section 02235 FLOATING TURBIDITY BARRIER, Section 02236 SEEDING, and Section 02237 PLANTING.

### 1.5 DELIVERY, INSPECTION, STORAGE, AND HANDLING

Materials shall be stored in designated areas and as recommended by the manufacturer protected from the elements, direct exposure, and damage. Containers shall not be dropped from trucks. Material shall be free of defects that would void required performance or warranty.

- a. Erosion control blankets shall be furnished in rolls with suitable wrapping to protect against moisture and extended ultraviolet exposure prior to placement. Erosion control blanket and geotextile fabric rolls shall be labeled to provide identification sufficient for inventory and quality control purposes.
- b. Seed shall be inspected upon arrival at the jobsite for conformity to species and quality. Seed that is wet, moldy, or bears a test date five months or older, shall be rejected.

### 1.6 SUBSTITUTIONS

Substitutions will not be allowed without written request and approval from

the Contracting Officer.

### 1.7 WARRANTY

Erosion control material shall have a warranty for use and durable condition for project specific installations. Temporary erosion control materials shall carry a minimum one year warranty. Permanent erosion control materials shall carry a minimum one year warranty.

## PART 2 PRODUCTS

### 2.1 TEMPORARY SEED

Any disturbed areas that will be left exposed for more than 30 days, and are not subject to construction traffic, shall immediately receive a temporary seeding of annual winter rye (*Lolium multiflorum*) at a rate of 50 lbs. per acre. Annual winter rye seed shall be free of millet or any other large-seed producing grass.

### 2.2 SEDIMENT TRAPS

Field constructed Sediment Traps shall consist of hay bales and 2" by 2" wooden stakes.

### 2.3 EROSION CONTROL BLANKET

Erosion Control Blankets shall be used for erosion control and vegetation establishment in areas labeled as inter-tidal marsh, where seeding and planting will provide long term stabilization.

The Erosion Control Blanket fabric shall conform to the following minimum roll values:

Property	Performance	Test Method
Weight	1000 g/m2	ASTM D 3776
Wet tensile strength		ASTM D 4595
MD	30.6 kN/m	
CD	18.2 kN/m	
Percent open area	35%	
Thickness	9.65 mm	
Recommended shear stress on bare soil	390 N/m2	

Wire staples used to secure the Erosion Control Blanket shall be of gauge 11 or lower. Staples shall be long enough to provide a strong bond between the blanket and the ground.

If wooden stakes are used to secure the Erosion Control Blanket, the minimum length shall be 12 inches.

## PART 3 EXECUTION

### 3.1 CONDITIONS

The Contractor shall submit a construction work sequence schedule, with the state approved erosion control plan a minimum of 30 days prior to start of construction. The work schedule shall coordinate the timing of land disturbing activities with the provision of erosion control measures. Erosion

control operations shall be performed under favorable weather conditions; when excessive moisture, frozen ground or other unsatisfactory conditions prevail, the work shall be stopped as directed. The Contractor shall notify the Contracting Officer or the Contracting Officer's Representative when erosion control operations are halted due to what are deemed unsatisfactory conditions. When special conditions warrant a variance to earthwork operations, a revised construction schedule shall be submitted for approval.

#### 3.1.1 Finished Grade

The Contractor shall verify that finished grades are as indicated on the drawings; finish grading and compaction shall be completed in accordance with Section 02300 EARTHWORK, prior to the commencement of the work. The location of underground utilities and facilities in the area of the work shall be verified and marked. Damage to underground utilities and facilities shall be repaired at the Contractor's expense.

#### 3.1.2 Placement of Erosion Control Blanket

Before placing the erosion control blankets, ensure the subgrade has been graded smooth; has no depressed, void areas; is free from obstructions, such as tree roots, projecting stones or other foreign matter. Vehicles shall not be permitted directly on the blankets. In addition specified seed mixes shall be broadcast on the finish grade prior to placing erosion control fabric (See Section 02236 SEEDING).

### 3.2 SITE PREPARATION

#### 3.2.1 Layout

Erosion control material locations may be adjusted to meet field conditions.

#### 3.2.2 Protecting Existing Vegetation

Existing trees and shrubs that are to remain shall be fenced or barricaded along the dripline. Damage to existing trees shall be mitigated by the Contractor at no additional cost to the Government. Damage shall be assessed by a state certified arborist or other approved professional using the National Arborist Association's tree valuation guideline.

#### 3.2.3 Obstructions Below Ground

When obstructions below ground affect the work, shop drawings showing proposed adjustments to placement of erosion control material shall be submitted for approval.

### 3.3 INSTALLATION

#### 3.3.1 Temporary Seeding

Temporary seeding shall be installed in accordance with Section 02236 SEEDING. Temporary seed shall be mulched in accordance with Section 02236 SEEDING.

#### 3.3.2 Sediment Traps

- 1) Line posts shall be driven into the ground to a minimum depth as shown

on the plans, or adequately anchored if rock is encountered. Posts shall be spaced as shown on the plans.

2) Geotextile shall be placed on the upland side of the posts, so that the posts are closer to the waterbody.

3) The geotextile shall be attached to each post in no less than three locations with approved fasteners.

4) Any geotextile splices necessary for fence erection shall be continuous between two post sections.

5) The bottom of the geotextile shall be buried in a wide trench as shown on the plans. The trench shall be backfilled with the excavated soil and the soil compacted by tamping.

### 3.3.3 Erosion Control Blankets

a. Erosion control blankets shall be installed as shown on the drawings and in accordance with manufacturer's recommendations. The extent of erosion control blankets shall be as shown on drawings.

b. Erosion control blankets shall be oriented in vertical strips and anchored with staples, as shown on the drawings. Adjacent strips shall be abutted to allow for installation of a common row of staples. Horizontal joints between erosion control blankets shall be overlapped sufficiently to accommodate a common row of staples with the uphill end on top.

c. Where exposed to overland sheet flow, a trench shall be located at the uphill termination. The erosion control blanket shall be stapled to the bottom of the trench. Backfill and compact the trench as required.

d. Where terminating in a channel containing an installed blanket, the erosion control blanket shall overlap installed blanket sufficiently to accommodate a common row of staples.

### 3.3.4 Silt Fence

Silt Fence shall be installed in accordance with Section 02234 SILT FENCE.

### 3.4 CLEAN-UP

Excess material, debris, and waste materials shall be disposed offsite at an approved landfill or recycling center. Adjacent paved areas shall be cleared.

### 3.5 MAINTENANCE

#### 3.5.1 Maintenance Record

A record shall be furnished describing the maintenance work performed, record of measurements and findings for product failure, recommendations for repair, and products replaced.

#### 3.5.2 Maintenance

Maintenance shall include eradicating weeds; protecting embankments and

ditches from surface erosion; and maintaining the performance of the erosion control materials. Areas of temporary seed shall be maintained in accordance with Section 02239 PLANT MAINTENANCE until permanent seeding/planting has taken place. The Contractor shall continuously maintain the integrity of the Sediment Traps and Silt Fence, including providing all necessary labor, equipment, and materials, until earthwork and planting is completed. The Contractor shall inspect all Soil Erosion and Sediment Control measures on a daily basis. The Contractor shall also inspect all Soil Erosion and Sediment Control measures immediately after each storm and at least daily during prolonged rainfall. The Contractor shall immediately correct any deficiencies.

#### 3.5.2.1 Maintenance Instructions

Written instructions containing drawings and other necessary information shall be furnished, describing the care of the installed material; including, when and where maintenance should occur, and the procedures for material replacement.

#### 3.5.1.2 Sediment Traps

The Contractor shall continuously maintain the integrity of the sediment traps, including providing all necessary labor, equipment and materials, until earthwork construction is completed and permanent erosion control measures are in place.

#### 3.5.1.3 Erosion Control Blanket

The Contractor shall continuously maintain the integrity of the erosion control blanket, including providing all necessary labor, equipment, and materials, until all construction activities have been completed. The Contractor shall inspect the erosion control blanket immediately after each storm that occurs throughout the life of the Contract. Any deficiencies shall be corrected immediately to the satisfaction of the Contracting Officer. Should the erosion control blanket become damaged or otherwise ineffective, the Contractor shall immediately repair or replace defective or damaged portions.

The Erosion Control Blanket will naturally degrade and will not require removal.

#### 3.5.1.4 Silt Fence

Silt fence shall be maintained in accordance with Section 02234 SILT FENCE.

### 3.6 FENCE REMOVAL

Silt fence that is to be removed upon acceptance of planting shall remain in place as shown in the project Contract Drawings until the Contracting Officer directs its removal. Upon removal, the Contractor shall remove and dispose of any sediment accumulations and restore the area as directed by Contracting Officer. The removed fence materials shall become the property of the Contractor and be removed from the site. The Contractor shall carefully remove silt fence and shall not damage plant material during extraction. Any area disturbed during the removal operation, in the opinion of the Contracting Officer, shall be repaired or replanted at no additional cost to the Corps.

### 3.7 RE-USE OF FENCE MATERIALS

Silt fence may be re-used on site for installation at a new location as shown on the drawings and as directed by the Contracting Officer, only if the materials are determined by the Contracting Officer to be in good and useable condition. Geotextile fabric and polypropylene mesh reinforcement must be intact, without holes, tears or fraying. Mesh must not be broken or twisted out of shape in such a way as to prevent a smooth even face of the silt fence. Stakes must be the specified height and not rotten, splintered or broken. Re-used materials used for installation of silt fence shall conform to the same specifications for new materials. The Contracting Officer may reject any or all salvaged materials and require the use of new materials on all silt fences in order to meet specifications.

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SECTION 02230

CLEARING AND GRUBBING

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## PART 1 GENERAL

### 1.1 SCOPE OF WORK

Under this section, the Contractor shall apply an aquatic herbicide to all areas of common reed (*Phragmites australis*) within the Clearing Area as shown on the construction drawings and as directed by the Contracting Officer. The Contractor shall also obtain any permits required for the herbicide application.

At least 45 days after the herbicide application, the Contractor shall clear and remove: 1) all objectionable material including trees, shrubs, brush, vines, standing *Phragmites* and wrack, stumps of all sizes, weeds, stones, boulders, tires, and trash and 2) the top 6 inches of loose surface litter, organic litter, *Phragmites* rhizomes, consolidated material, leaf litter, and other organic debris. This material shall be removed from within the Limits of Clearing and Grubbing, in accordance with the Contract Drawings and specifications, and the direction of the Contracting Officer and properly disposed of at an approved off site location. At no time shall the Contractor dispose of on site any debris, soil or other material that may or does contain *Phragmites australis* rhizome.

The Contractor shall carefully protect all areas to remain vegetated, and shall also be liable for any and all damages to property caused by the work under this section. Any damages to property or to vegetated areas shall be restored to the original conditions to the satisfaction of the Contracting Officer at the Contractors expense.

All organic material, tires, and trash cleared under this section shall be disposed of, prior to excavation activities, at an appropriate off-site facility to be approved by the Contracting Officer.

### 1.2 MEASUREMENT AND PAYMENT

#### 1.2.1 Payment Item No. 0005A Site Clearing

For performing the work under this item, in accordance with the Contract Drawings, specifications and directions of the Contracting Officer, the Contractor shall receive a LUMP SUM. The lump sum price bid shall include the cost of all labor, materials, and equipment necessary for clearing all objectionable material from within the Limits of Clearing and Grubbing, Low marsh, High marsh, and Maritime Scrub/Shrub areas as shown on the Contract Drawings, and all work incidental thereto, in accordance with the Contract Drawings and specifications and to the satisfaction of the Contracting Officer. The lump sum price shall also include: the disposal of organic materials at an off-site facility; the cost of the herbicide applied for *Phragmites* eradication; and any fees associated with acquiring permits.

### 1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data  
Tree wound paint, G, A.



Submit product information 30 days prior to starting work.

Herbicide, G, A.

Submit product information 30 days prior to starting work.

## PART 2 PRODUCTS

### 2.1 TREE WOUND PAINT

Bituminous based paint of standard manufacture specially formulated for tree wounds.

### 2.2 HERBICIDE

RODEO herbicide manufactured by Monsanto Industries, or an approved equal shall be the herbicide used to eradicate unwanted and/or invasive plant species in and around the Planned Wetland Area.

## PART 3 EXECUTION

### 3.1 DELIVERY, STORAGE, AND HANDLING

Materials shall be delivered in the original, unopened containers bearing the manufacturer's chemical analysis, and store at the site in accordance with the manufacturer's instructions and the New York State Department of Environmental Conservation (NYSDEC) regulations.

### 3.2 METHOD

The Contractor shall perform work as indicated under this section prior to beginning work on excavation covered under other sections as directed by the Contracting Officer.

#### 3.2.1 Permits

The Contractor shall be responsible for preparing, submitting, and obtaining any permits from federal, state, borough or local agencies that are required to authorize the spraying of herbicide. Copies of the permits shall be available for review by the Contracting Officer upon request prior to the application of any herbicide.

#### 3.2.2 Invasives Eradication

The Contractor shall apply herbicide at a rate in accordance with the manufacturer's instructions and the NYSDEC regulations. The Contractor shall apply herbicide via backpack foliar spraying at least 45 days prior to beginning clearing/grubbing or excavation. Post construction, herbicide shall not be applied by backpack spraying or any other means (other than the primary pre-construction application), which, in the opinion of the Contracting Officer or the Contracting Officer's Representative, will result in the destruction of either existing native or planted wetland vegetation.

The Contractor shall be responsible, as necessary, for bi-annual herbicide application, during the contract warrantee period. The initial application of RODEO shall be applied between August and early October, when the product is most effective at killing rhizomes. The Contracting Officer or the Contracting Officer's Representative shall inspect the planned wetland, post construction, for the reestablishment/presence of invasive species of vegetation (i.e. *Phragmites australis*, *Polygonum cuspidatum*, *Wisteria*

*frutescens*, *Ailanthus altissima*, *Celastris orbiculatus*, *Ampelopsis brevipedunculata*, *Rosa multiflora* and *Artemisia vulgaris*). Post construction, Rodeo shall be applied by hand painting, backpack sprayer or other controlled means under the direction of the Contracting Officer or the Contracting Officer's Representative in such a manner as to prevent collateral damage to existing native or planted vegetation.

The surfactant used in conjunction with the application of RODEO shall be exempt from the requirements of tolerance under Title 40, CFR, 180.1001(d). Examples of such surfactants include LI 700 (Loveland Industries, Inc.) and Cygnet Plus (Brewer International).

### 3.3 CLEARING

Clearing shall consist of the felling, trimming, and cutting of trees into sections and the satisfactory disposal of the trees and other vegetation designated for removal, including downed timber, snags, brush, and rubbish occurring within the areas to be cleared. [Clearing shall also include the removal and disposal of structures that obstruct, encroach upon, or otherwise obstruct the work.] Trees, stumps, roots, brush, and other vegetation in areas to be cleared shall be cut off flush with or below the original ground surface, except such trees and vegetation as may be indicated or directed to be left standing. Trees designated to be left standing within the cleared areas shall be trimmed of dead branches 1-1/2 inches or more in diameter and shall be trimmed of all branches the heights indicated or directed. In addition any such trees shall be protected from damage potentially caused by construction activities. Every effort shall be made to avoid excessive damage to the roots of trees to be left standing. Limbs and branches to be trimmed shall be neatly cut close to the bole of the tree or main branches. Cuts more than 1-1/2 inches in diameter shall be painted with an approved tree-wound paint. Apply herbicide in accordance with the manufacturer's label to the top surface of stumps designated not to be removed.

### 3.4 TREE REMOVAL

Where indicated on the drawings or directed by the Contracting Officer or the Contracting Officer's Representative, trees and stumps shall be removed from areas outside those areas designated for Limits of Clearing and Grubbing. This work shall include the felling of such trees and the removal of their stumps and roots as specified in paragraph GRUBBING. Trees shall be disposed of as specified in paragraph DISPOSAL OF MATERIALS.

### 3.5 PRUNING

The Contractor shall trim trees designated to be left standing within the cleared areas of dead branches 1 1/2 inches or more in diameter; and trim branches to heights and in a manner as indicated. Neatly cut limbs and branches to be trimmed close to the bole of the tree or main branches. Paint cuts more than 1 1/4 inches in diameter with an approved tree wound paint.

### 3.6 GRUBBING

Grubbing shall consist of the removal and disposal of stumps, roots larger than 3 inches in diameter, and matted roots from the designated grubbing areas.

Material to be grubbed, together with logs and other organic or metallic debris not suitable for as sub-grade or planting medium purposes, shall be removed to a depth of not less than 18 inches below the original surface

level of the ground and/or finish grades in areas indicated to be grubbed and in areas indicated as construction areas under this contract. Depressions made by grubbing shall be filled with suitable material and compacted to make the surface conform with the original adjacent surface of the ground.

### 3.7 WRACK REMOVAL

All wrack and debris that has collected in the low marsh, high marsh, and maritime scrub/shrub planting areas shall be thoroughly removed and disposed of off-site. Every effort shall be made to avoid damage to the existing wetland vegetation adjacent to these areas.

### 3.8 DISPOSAL OF MATERIALS

Logs, stumps, roots, brush, rotten wood, and other refuse from the Clearing and Grubbing operations shall be disposed of at the appropriate off-site facilities, except when otherwise directed in writing by the Contracting Officer or the Contracting Officer's Representative. Such directive will state the conditions covering the disposal of such products and will also state the areas in which they may be placed.

### 3.9 PROTECTION

#### 3.9.1 Roads and Walks

The Contractor shall keep roads and walks free of dirt and debris at all times. This includes any of the roads or walkways on the interior of or that service the adjacent Keyspan energy facility and/or Gulf Avenue.

#### 3.9.2 Trees, Shrubs, and Existing Facilities

Trees, shrubs, and existing facilities shall be protected in accordance with Section 01551, Site Clearing for Staging Area. Trees and vegetation to be left standing shall be protected from damage incident to clearing, grubbing, and construction operations by the erection of barriers or by such other means as the circumstances require.

#### 3.9.3 Utility Lines

The Contractor shall protect all existing utility lines from damage. The Contractor shall notify the Contracting Officer immediately of damage to or an encounter with an unknown existing utility line. The Contractor shall be responsible for the repairs of damage to existing utility lines that are indicated or made known to the Contractor prior to start of clearing and grubbing operations. When utility lines which are to be removed are encountered within the area of operations, the Contractor shall notify the Contracting Officer in ample time to minimize interruption of the service. Refer to Section 01552, TEMPORARY FACILITIES and CONTROLS for additional utility protection.

-- End of Document --

SECTION 02232

SURVEYING

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## PART 1 GENERAL

### 1.1 SCOPE OF WORK

Under this item, the Contractor shall employ the services of a New York State licensed land surveyor to compile original and final cross-sections, appropriate contour elevations and volume computations for earthwork within the project site.

The Contractor shall be responsible for all necessary surveying required to construct all elements of the project as shown on the Contract Drawings and specified herein using the control points and data furnished. The Contractor shall also provide additional horizontal and vertical control points along the project area as required for construction or as directed by the Engineer.

Prior to starting work the Contractor shall establish control within the site and confirm the site limits of disturbance as indicated on the Contract Drawings.

The Contractor's Land Surveyor shall be responsible for the final stakeout, which shall serve to establish elevation criteria for the various planting zones.

Upon completion of the work, an as-built survey shall be provided. The as-built survey shall be signed and sealed by the Contractor's Land Surveyor, licensed to practice in the State of New York.

All project installations improperly constructed as a result of inadequate or erroneous survey layout shall be properly relocated by the Contractor at no cost to the USACE.

### 1.2 PURPOSE

To quantify and certify the volume and elevations of earthwork associated with the project, and to ensure that final elevations are as shown on the Contract Drawings at project completion.

### 1.3 APPROVAL OF SURVEYOR

Any New York State Licensed Land Surveyor may be submitted for approval. Approval must be received from the Contracting Officer or the Contracting Officer's Representative prior to commencing any survey work.

The Contractor shall submit, for approval, the name and copy of current New York State Registration Certificate for the proposed land surveyor to the Contracting Officer or the Contracting Officer's Representative.

### 1.4 SUBMITTALS

The Contractor shall furnish the Contracting Officer or the Contracting Officer's Representative with the following:

1. Prior to actual field operation by Contractor: Create a base line with appropriate ties within the project site for the purpose of running cross-sections for volume computation. Run original grades on a fifty-foot

grids unless otherwise directed by the Contracting Officer or the Contracting Officer's Representative. Also note all significant intermediate grade changes. Provide the Contracting Officer or the Contracting Officer's Representative with two copies of a map at 1"=20'-0" showing original grades, base line with ties, and description and elevation of benchmark used.

2. After completion of all earthwork: Take final sections along the same grid and generate profiles of original grade and final grade plotted at 1"=2'-0" vertical and 1"=20'-0" horizontal. Compute End Areas and note data adjacent to each section on cross-section paper in ink. Provide notes where applicable.

3. Perform column computations for cut and fill using Average End Area method. Provide total quantity of cut and fill. All pertinent calculation sheets shall be submitted with column computations. Submit copies of all field notes.

4. Drawings/Final Submittal: Submit one original and two blue-line prints showing original and final grades on the project grid. The original drawing shall conform to all aspects of the specifications of the Contracting Officer's Office at the ACOE - New York District Office (212-264-0100).

NOTE: ALL DRAWINGS MUST BE SIGNED AND SEALED BY APPROVED LICENSED SURVEYOR.

#### 1.5 DATUM

Vertical and horizontal datum shall conform to contract topographic survey datum (NAVD 88).

#### 1.6 MEASUREMENT AND PAYMENT

##### 1.6.1 Payment Item No. 0006 Surveying

For providing the services of a licensed land surveyor, the Contractor shall receive a LUMP SUM price bid.

Partial payments shall be made as follows:

- Upon submission and approval of No.1 above the Contractor shall receive twenty percent (20%) of the LUMP SUM bid.

- Upon submission and approval of Nos. 2 and 3 above the Contractor shall receive sixty percent (60%) of the LUMP SUM bid.

- Upon submission and approval of No. 4 above the Contractor shall receive the final twenty percent (20%) of the LUMP SUM bid.

All work must meet the approval of the Contracting Officer or the Contracting Officer's Representative.

#### PART 2 PRODUCTS

##### 2.1 Materials

The Contractor's Land Surveyor shall provide all instruments, equipment, stakes, marking paints and other materials necessary to perform the work satisfactorily.

## PART 3 EXECUTION

### 3.1 General

Qualified personnel and adequate equipment shall be made available by the Contractor to maintain control points and layout all lines and grades throughout the duration of the Contract.

The exact position of all work points shall be established from control points, base line transit points and/or other points of similar nature.

The Contractor's Land Surveyor shall clearly identify bench marks and record existing elevations. Locate datum level used to establish bench mark elevations sufficiently distant so as not to be affected by movement resulting from excavation operations.

The Contractor's Land Surveyor shall establish, check on a weekly basis, re-establish when necessary and maintain control points throughout the life of the Contract to permit the Engineer to make the necessary preliminary, interim and final measurements and to check the Contractor's layout.

The Contractor shall be responsible for the preservation of all control points. If control points are damaged, lost or moved, they shall be reset at no additional expense to the USACE. Control points outside as well as inside the Contract Limits shall be used for construction.

Should bench mark readings indicate displacement, the Contractor shall halt operations until corrective action has been provided and is acceptable to the USACE.

The Contractor shall provide and maintain offset stakes for each base line, at each station, and out of the limits of grading and construction. Each stake shall be identified and marked to show the offset distance from the base line and the Contractor shall furnish sheets showing cuts and fills to the finished profile and cross section lines.

Any error, apparent discrepancy or absence of data shown or required for accurately accomplishing the survey work shall be referred to the Engineer within 24 hours of discovery for interpretation or furnishing when such is observed or required.

The Engineer may check all or any portion of the survey work or notes made by the Contractor. Any necessary correction to the work shall be made immediately by the Contractor. Such verification by the Engineer shall not relieve the Contractor of any responsibilities for the accuracy and completeness of his work.

The Contractor shall keep a survey transit and level with tripod and survey rod on the project at all times to be used for checking inverts, surveyors stakes, etc.

The Contractor shall submit all survey data for daily checks, to the Office of the Engineer within twenty-four (24) hours after the data is obtained. The Contractor shall submit cut sheets for the Engineer's approval prior to any construction activity for the purpose of verifying the construction layout. Cut sheets for any particular item of work shall be submitted at least forty-eight hours prior to the need for approval.

### 3.2 Survey Errors

All project installation improperly constructed or located as a result of inadequate or erroneous survey layout shall be relocated or reconstructed, after demolition and/or removal of the improper work as necessary, by the Contractor at no charge to the USACE.

### 3.3 Confirmation of Work Limits

Prior to commencing work with Contractor shall establish survey control adjustment to and within the site. For this purpose his surveyor shall use known features and any available area existing survey control

Once survey control is established, the Contractor's surveyor shall stake out the site limits of disturbance, including confirmation of the limit of wetlands and limit of fill. The Contractor shall submit a plan showing this stakeout work to the USACE for review and approval.

### 3.4 Final Stakeout

On completion of all earthwork operations the Contractor shall stakeout a 50 by 50 foot grid with the actual as-built elevation of the ground where the stake has been placed marked on each stake.

The Survey Grid of stakes must be maintained until the Final As-Built Topo-Survey is approved.

All Planting Zone Stakes (1" x 1" x 3' wooden lath) shall remain, unless otherwise directed by Site Engineer.

### 3.5 Tolerances

The Contractor shall establish final grades in the planned wetland in conformance with the prescribed grades, cross-sections, and dimensions shown on the Contract Drawings by backfilling the planned wetland with stockpiled wetland topsoil material.

Note that the upland grades shown on the drawings are approximate, in that final grades shall be determined on the basis that all site cut operations are to be balanced by filling with the exception of debris to be disposed off off-site.

All final grades in the planned wetlands shall be within 0.1 foot of the grades shown on the Contract Drawings. All final grades in the maritime shrub/scrub area shall be within 0.5 foot of the elevations on the Contract Drawings.

### 3.6 As-Built Survey

At completion of the work, but prior to the USACE's acceptance of the work, the Contractor shall prepare an as-built topographic survey and 30" x 42" mylar drawing at a 1:30 scale accuracy. The drawing shall show all as-built features and installations, and shall bear the signature and seal of the Contractor's Surveyor. The drawing shall be submitted to the USACE's Engineer for review and approval. The drawing shall indicate the Contractor's name, the dates of construction, the United States Army Corps of Engineers as Permittee, the DEP Permit # 2-6499-00001/00002, and Owner's Signature block. After approval the Contractor shall submit one (1) mylar, five (5) prints, and a disc (CD) copy (AutoCad compatible format) of the final drawing(s).



-- End of Section --

SECTION 02233

EARTHWORK

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## PART 1 GENERAL

## 1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

## AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 136	(1996a) Sieve Analysis of Fine and Coarse Aggregates
ASTM D 422	(1963; R 1998) Particle-Size Analysis of Soils
ASTM D 1140	(1997) Amount of Material in Soils Finer than the No. 200 (75-micrometer) Sieve
ASTM D 1556	(1990; R 1996e1) Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 2487	(1998) Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D 4318	(1998) Liquid Limit, Plastic Limit, and Plasticity Index of Soils

## 1.2 SCOPE OF WORK

Under this item the Contractor shall perform excavation and fill activities, not included under other sections, required for grading the site. Excavated and fill materials shall be placed and compacted, in accordance with the Contract Drawings, specifications, and directions of the Contracting Officer or the Contracting Officer's Representative.

The Contractor shall carefully protect all preserved areas as shown on the Contract Drawings, and shall also be liable for any and all damages to property caused by the work under this section. Any damages to property or to vegetation within preserved areas shall be restored to the original conditions to the satisfaction of the Contracting Officer or the Contracting Officer's Representative.

## 1.3 MEASUREMENT AND PAYMENT

## 1.3.1 Payment Item No. 0007A Unclassified Excavation

The unit of measurement for excavation shall be the CUBIC YARD of soil excavated to meet the grades in areas of cut as shown on the Contract Drawings. The measurements will not include the volume of subgrade material or other material that is scarified or plowed and reused in-place, any volume excavated without authorization or the volume of any material used for purposes other than directed, and any excavation performed prior to checking the elevations of the existing grades.

The excavation volume shall be computed by the average end area method from cross-sections taken before and after the excavation operations, including

overcut of 18" in areas marked High Marsh, overcut of 6" in areas marked Maritime Scrub/Shrub on the Contract Drawings, and an overcut of 18" in any area where construction debris are encountered within 18" below final grade when the material is acceptably utilized or disposed of as herein specified.

This item shall be paid for at the Contract unit price per CUBIC YARD for unclassified excavation. The unit price shall include all labor, equipment, tools, supplies, and incidental expenses necessary for rough grading; excavation, disposal, delivery, and placement of excavated material; any necessary pumping, sheeting, and/or bracing; and other incidental work and expenses necessary to complete the work under this item. Disposal shall be at an approved facility that meets all local, state, and federal regulations. The price bid shall also include excavation, hauling, and spreading or piling of on-site clean sand material and related miscellaneous operations.

No direct payment will be made for re-handling of excavated materials for any other purposes necessary to complete the work as shown on the Contract Drawings. The compensation will be considered as having been included in the price bid for unclassified excavation. Re-handling of excavated materials may be paid for as excavation when the same is made necessary by changes of Contract Drawings and is ordered in writing by the Contracting Officer or the Contracting Officer's Representative.

The CUBIC YARD price bid shall include the excavation and hauling of all buried tires and trash.

For computation of quantities of excavation, no deductions shall be made in the areas of any cross section for any pipe or similar obstruction unless the area of such obstruction is greater than one square foot. Unless otherwise specified, all Excavation payment lines shall be produced from neat lines. Volume calculations shall be from maps as produced by a licensed surveyor, to be paid for under the item "Services of a Licensed Land Surveyor" under Section 02232 SURVEYING.

#### 1.3.2 Payment Item No. 0007B Clean Sand-Imported

Clean sand imported from off-site shall be measured by the CUBIC YARD of additional imported clean sand needed to meet the grades for the maritime scrub and high marsh areas as shown on the Contract Drawings.

This item shall be paid for at the Contract unit price per CUBIC YARD in place for imported clean sand. The unit price shall include all labor, equipment, tools, supplies, and incidentals necessary to complete the work under this item.

Payment for installation, maintenance, and removal of Silt Fence, shall be made under Payment Item NO. 0011, which is described in Section 02320 SILT FENCE.

#### 1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Clean Sand-Imported G,A.

Submit product information 30 days prior to starting work.

SD-06 Test Reports

Clean Sand-Imported EPA test; G,A.

Clean Sand Material Gradation Tests; G,A.

Submit 2 copies of the test results within 3 days of conclusion of the testing.

SD-07 Certificates

Testing Laboratory Qualifications; G,A.

Submit qualifications of the commercial testing laboratory or Contractor's testing facilities when test reports are submitted.

1.5 SUBSURFACE DATA

The soil boring logs are located in attached reference document 00903 BORING LOGS. This data represents the best subsurface information available; however, variations may exist in the subsurface between boring locations.

1.6 CRITERIA FOR BIDDING

The Contractor shall base bids for this section on the following criteria:

- a. Surface elevations as indicated on the Contract Drawings.
- b. Material character as indicated in the boring logs.

PART 2 PRODUCTS

2.1 MATERIAL REQUIREMENTS

2.1.1 Satisfactory Materials For Clean Sand-Imported

Satisfactory materials for clean sand imported from off-site shall meet the following requirements:

- a. Materials classified under Section 02240 CLEAN SAND
- b. Materials with a combined silt and clay content of less than 10 percent.

2.2 MATERIALS

Clean Sand-Imported: Clean sand meeting the requirements of subparagraph 2.1.1 Satisfactory Materials For Clean Sand-Imported.

PART 3 EXECUTION

3.1 ROUGH GRADING

After the completion of the work under Section 02230 CLEARING AND GRUBBING for the area of the Project Site shown as Clearing Area on the Contract Drawings, and prior to the commencement of the placement of clean sand in the area shown as Maritime Scrub/Shrub in this area, the existing surface shall be rough graded. Rough grading shall consist of the filling of depressions with existing soils from within the Clearing Area to create a smooth well-graded surface that does not impound water.

### 3.2 EXCAVATION

Any excavation or other construction activities shall not commence until all soil erosion and sediment control measures (see Section 02234 SILT FENCE), Chain Link Security Fence, and Construction Fence (see Section 02821 FENCING) have been installed.

The Contractor shall perform excavation of every type of material encountered within the limits of the project to the lines, grades, and elevations as specified on the Contract Drawings. During construction, excavation and fill shall be performed in a manner and sequence that will provide proper drainage at all times. The Contractor shall maintain excavations and fills free from detrimental quantities of leaves, brush, sticks, trash, and other debris until final acceptance of the work. Grading shall be in conformity with the typical sections shown and tolerances specified in paragraph 3.6 FINISHING.

Any vegetation within preserved areas damaged by the work under this section, as determined by the Contracting Officer or the Contracting Officer's Representative, shall be replaced immediately after the completion of the work at no additional cost to the Government.

#### 3.2.1 Drainage

The Contractor shall schedule work to coincide with advantageous low tide cycles. Excavation shall not proceed in areas which are inundated by tidal waters. Work shall proceed in intertidal areas only during a time at which the areas are drained of tidal waters.

Material shall not be dewatered on site. Excavated material shall be stockpiled as specified in paragraph 3.3 STOCKPILE and allowed to dry before hauling to the offsite disposal area. Any wet material shall be carted in a watertight truck bed.

The Contractor shall provide for the collection and proper disposal of surface and subsurface water encountered during construction. The Contractor shall drain the upland areas during periods of construction to keep soil materials sufficiently dry. When unsuitable working platforms for equipment operation and unsuitable soil support for subsequent construction features develop, the Contractor shall utilize the necessary measures to permit construction to proceed. It is the responsibility of the Contractor to assess the soil and groundwater conditions presented by the Contract Drawings and specifications and to employ necessary measures to permit construction to proceed.

Any materials used to support construction features that are not suitable to remain at the project site shall be removed at the completion of construction as directed by the Contracting Officer or the Contracting Officer's Representative.

#### 3.2.2 Dewatering

Groundwater flowing toward or into excavations shall be controlled to prevent sloughing of excavation slopes, boils, and uplift and heave in the excavation and to eliminate interference with orderly progress of construction. Control measures shall be taken by the time the excavation reaches the water level in order to maintain the integrity of the in situ material.

Dewatering shall be achieved through the use of a portable water pump and sediment filter bag system. The non-woven geotextile filter bag shall retain

all sediment particles larger than 150 microns. Filter bags shall be placed on stable or well vegetated areas which are flatter than 5% and which will not erode when subjected to bag discharges shown on the Contract Drawings.

### 3.2.3 Utilities

It is the Contractor's responsibility to detect and protect existing utilities (to remain), including the high-pressure gas main, from damage during construction. Between 2 and 10 working days prior to start of construction, not including the day of the call, the Contractor is required to notify:

Call Before You Dig - New York  
1-800-962-7962  
[www.digsafelynewyork.com](http://www.digsafelynewyork.com)

Movement of construction machinery and equipment over pipes and utilities during construction shall be at the Contractor's risk. If a utility is inadvertently damaged, it shall be the Contractor's responsibility to restore that utility to operating condition, equal to that existing prior to damage. The Contractor shall remain at the site with the damaged utility until it has been restored and there is no danger to the public (i.e. exposed live wires, etc.). Should the Contractor need to cut off utilities or services during the performance of the work, the Borough Department or Utility Company owning or controlling services shall be notified and requested to cut off these services. Any services cut off or interrupted by the Contractor's operations shall be restored at the Contractor's expense.

Any work adjacent to non-Government utilities shall be performed as indicated in accordance with procedures outline by the utility company.

For work immediately adjacent to or for excavations exposing a utility, high-pressure gas main, or other buried obstruction, excavation shall be done by hand. Hand excavation shall be started on each side of the indicated obstruction and continue until the obstruction is uncovered or until clearance for the new grade is assured. Uncovered lines or other existing work affected by the Contract excavation shall be supported until approval for backfill is granted by the Contracting Officer or the Contracting Officer's Representative. Damage to utility lines or subsurface construction shall be reported immediately to the Contracting Officer or the Contracting Officer's Representative.

### 3.2.4 Existing Drainage Structures

There are three stormwater outfalls, and a ductile iron stormwater pipe located within the limits of excavation shown on the Contract Drawings. It is the Contractor's responsibility to protect these structures from damage during construction. If an Existing Drainage Structure is inadvertently damaged, it shall be the Contractor's responsibility to restore that structure to operating condition, equal to that existing prior to damage.

For work immediately adjacent to the Existing Drainage Structures, excavation shall be done by hand. Hand excavation shall be started on each side of the structure and continue until it is uncovered or until clearance for the new grade is assured. Existing Drainage Structures affected by the Contract excavation shall be supported until approval for backfill is granted by the Contracting Officer or the Contracting Officer's Representative. Damage to Existing Drainage Structures shall be reported immediately to the Contracting Officer or the Contracting Officer's Representative.

### 3.3 STOCKPILE

Stockpiles shall be kept in a neat and well drained condition, giving due consideration to drainage at all times. Stockpiles shall be located on and covered by plastic. The ground surface at stockpile locations shall be cleared, grubbed, and sealed by rubber-tired equipment. Stockpiles shall be surrounded with Silt Fence for soil erosion and sediment control. Silt fence shall be installed in accordance with Section 02320 SILT FENCE.

### 3.4 GROUND SURFACE PREPARATION

The existing ground surface shall be scarified to a depth of 6 inches before sand is placed. Sloped surfaces steeper than 1 vertical to 4 horizontal shall be plowed, stepped, benched or broken up so that the fill material will bond with the existing material.

Material shall not be placed on surfaces that are muddy, frozen or contain ice.

### 3.5 PLACING CLEAN SAND

In the Maritime Scrub/Shrub area, clean sand shall be spread evenly to a thickness of 6 inches and graded to the elevations and slopes shown on the Contract Drawings. Clean sand shall not be spread when excessively wet. In the high marsh area, clean sand shall be spread evenly to a thickness of 18 inches and graded to the elevations and slopes shown on the Contract Drawings.

### 3.6 FINISHING

The surface of excavations, embankments, and subgrades shall be finished to a smooth and compact surface in accordance with the lines, grades, and cross sections or elevations shown in the Contract Drawings. The degree of finish for graded areas shall be within 0.1 foot of the grades and elevations shown in the Contract Drawings.

### 3.7 TESTING

Testing shall be performed by an approved commercial testing laboratory or by the Contractor subject to approval. When test reports are submitted, the Contractor shall submit the Testing Laboratory Qualifications for either a commercial testing laboratory or the Contractor's testing facilities. If the Contractor elects to establish testing facilities, no work requiring testing will be permitted until the Contractor's facilities have been inspected and approved by the Contracting Officer or the Contracting Officer's Representative.

#### 3.7.1 Clean Sand-Imported EPA Testing

Clean sand imported from off-site shall be tested for full Priority Pollutant + 40 parameters, pH and full TCLP including ignitability, corrosivity and reactivity. Clean sand shall not be brought on site until the tests have been approved by the Contracting Officer or the Contracting Officer's Representative.

#### 3.7.2 Clean Sand Material Gradation Tests

The Contractor shall perform one test per 2,500 cubic yards in-place on imported clean sand material. Gradation shall be determined in accordance



with ASTM D 422 and meet the requirements of section 02240 CLEAN SAND. Clean sand materials shall not be brought on to the site until the gradation test have been approved by the Contracting Officer or the Contracting Officer's Representative.

-- End of Section --

## SECTION 02236

## SEEDING

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## PART 1 GENERAL

### 1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

#### AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- |             |   |
|-------------|---|
| ASTM D 4972 | (1995a) pH of Soils                                     |
| ASTM D 5268 | (1992; R 1996) Topsoil Used for<br>Landscaping Purposes |

#### U.S. DEPARTMENT OF AGRICULTURE (USDA)

- |              |   |
|--------------|---|
| AMS Seed Act | (1995) Federal Seed Act Regulations<br>Part 201 |
|--------------|---|

### 1.2 MEASUREMENT AND PAYMENT

#### 1.2.1 Payment Item No. 0010A Permanent Seed Species and Mixtures

This item will be measured as the number of ACRES, measured to the nearest tenth of an ACRE of area seeded with Permanent Seed Species and Mixtures. Planting areas to be seeded are labeled as Maritime Scrub on the Contract Drawings. Measurement shall be based on the Contract Drawings and actual field measurements of areas seeded. The unit price bid per ACRE shall be for seed material only. Cost of labor, materials, and equipment necessary to install seed shall be made under Payment Item No. 0010B Permanent Seed Species and Mixtures Installation.

#### 1.2.2 Payment Item No. 0010B Permanent Seed Species and Mixtures Installation

For performing the work under this item, in accordance with Contract Drawings, specifications and directions of the Contracting Officer, the Contractor shall receive a LUMP SUM. The LUMP SUM price bid shall include the cost of all labor, materials, and equipment necessary to install seed material within the areas shown on the Contract Drawings, and all work incidental thereto, in accordance with the Contract Drawings and specifications and to the satisfaction of the Contracting Officer and/or the Contracting Officer's Representative.

#### 1.2.3 Payment Item No. 0010C Soil Amendments

This item will be measured by the SQUARE YARD of surface area covered. The unit price bid per SQUARE YARD shall be for soil amendment materials only. No measurement for payment shall be made for miscellaneous materials or equipment necessary for placement of the soil amendments.

#### 1.2.4 Payment Item No. 0010D Mulch

This item will be measured by the SQUARE YARD of surface covered. The unit price bid per SQUARE YARD shall be for mulch materials only. No measurement for payment shall be made for binder, dye or other miscellaneous materials or equipment necessary for placement of the mulch.

Payment for the installation of the Erosion Control Blanket shall be made under Section 01553 SOIL EROSION AND SEDIMENT CONTROL.

Payment for the installation of Temporary Seed shall be made under Section 01553 SOIL EROSION AND SEDIMENT CONTROL.

Payment for the maintenance of seeded areas shall be made under Section 02237 PLANTING AND PLANT MATERIAL MAINTENANCE.

### 1.3 SUBMITTALS

The following shall be submitted to the Contracting Officer and/or the Contracting Officer's Representative in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Data

Literature; G, A.

Manufacturer's literature including physical characteristics, application and installation instructions for equipment, surface erosion control material and chemical treatment material.

Equipment; G, A.

A listing of equipment to be used for the seeding operation.

Quantity Check; G, A.

A bag count or bulk weight measurements of material used compared with area covered to determine the application rate and quantity installed.

Seed Establishment Period; G, A.

Calendar time period for the seed establishment period. When there is more than one seed establishment period, the boundaries of the seeded area covered for each period shall be described.

Maintenance Record; G, A.

Maintenance work performed, area repaired or reinstalled,  
diagnosis for unsatisfactory stand of grass plants.

#### SD-06 Reports

##### Inspection Reports; G, A.

Certified reports of inspections and laboratory tests, prepared by an independent testing agency, including analysis and interpretation of test results. Each report shall be properly identified. Test methods used and compliance with recognized test standards shall be described.

#### SD-07 Certificates

##### Seed; G, A.

Prior to the delivery of materials, certificates of compliance attesting that materials meet the specified requirements. Certified copies of the material certificates shall include the following: Classification, botanical name, common name, percent pure live seed, minimum percent germination and hard seed, maximum percent weed seed content, and date tested.

##### Calibration; G, A.

Certification of calibration tests conducted on the equipment used in the seeding operation.

##### Sand; G, A.

Particle size, pH, organic matter content, textural class, soluble salts, chemical and mechanical analyses.

##### pH Adjuster; G, A.

Calcium carbonate equivalent and sieve analysis.

##### Organic Material; G, A.

Composition and source.

##### Soil Conditioner; G, A.

Composition and source.

##### Mulch; G, A.

Composition and source.

##### Pesticide; G, A.

EPA registration number and registered uses.

#### 1.4 SOURCE INSPECTION

The source of delivered seed shall be subject to inspection.

#### 1.5 DELIVERY, INSPECTION, STORAGE, AND HANDLING

##### 1.5.1 Delivery

A delivery schedule shall be provided at least 10 calendar days prior to the first day of delivery.

##### 1.5.1.1 Delivered Seed

Prior to the delivery of any seed, its availability shall be verified in

paragraph 2.1 SEED. A germination test shall be provided for seed delivered to the site.

#### 1.5.2 Inspection

Seed shall be inspected upon arrival at the job site for conformity to species and quality. Seed that is wet, moldy, or bears a test date five months or older, shall be rejected.

#### 1.5.3 Storage

Materials shall be stored in designated areas as shown on the contract drawings or as otherwise directed by the Contracting Officer or the Contracting Officer's Representative. Seed shall be stored in cool, dry locations away from contaminants.

#### 1.5.4 Soil Amendments

Soil amendments, if required, shall be delivered to the site in the original, unopened containers bearing the manufacturer's chemical analysis. In lieu of containers, soil amendments may be furnished in bulk. A physical and chemical analysis shall be provided for bulk deliveries.

#### 1.5.4 Handling

Except for bulk deliveries, materials shall not be dropped or dumped from vehicles.

#### 1.5.5 Time Limitation

Hydroseeding time limitation for holding seed in the slurry shall be a maximum 24 hours. The specified warm season grass mix should be broadcast as a dormant season seeding between September 30 and October 30. The warm season grass mix germination rates are increased greatly if broadcast in the fall and allowed to stratify overwinter. The *Spartina* sp. seed can be broadcast seeded in the spring between May 15 and June 30 or as a dormant season seeding between September 15 and October 30.

## PART 2 PRODUCTS

### 2.1 SEED

#### 2.1.1 Seed Classification

Natural Resources Conservation Service (NRCS) Plant Materials Center or American Nursery and Landscape Association (ANLA) approved seed of the latest season's crop shall be provided in original sealed packages bearing the producer's guaranteed analysis for percentages of mixture, purity, germination, hard seed, weed seed content, and inert material. Labels shall be in conformance with any applicable state seed laws. Seed shall be from varieties adapted to the northeast.

#### 2.1.2 Permanent Seed Species and Mixtures

Permanent seed species and mixtures shall be proportioned by weight as follows:

<u>Botanical Name</u>	<u>Common Name</u>	<u>Mixture Percent by Weight</u>	<u>Application Rate</u>
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## WETLAND SEED

<i>Spartina</i>	Saltmarsh	15 pls/sf
<i>alterniflora</i>	Cord Grass	
<i>Solidago</i>	Seaside	
<i>sempervirens</i>	Goldenrod	
<i>Apocynum</i>	Indian Hemp	
<i>cannabinum</i>		

## MARITIME SCRUB/SHRUB SEED

Warm Season Grass Mix		25 lbs/acre
<i>Panicum</i>	Switchgrass	20
<i>virgatum</i>		
<i>Panicum</i>	Deertongue	4
<i>clandestinum</i>		
<i>Festuca rubra</i>	Red Fescue	15
<i>Andropogon</i>	Little Bluestem	20
<i>scoparius</i>		
<i>Andropogon</i>	Big Bluestem	15
<i>gerardii</i>		
<i>Sorghastrum</i>	Indian Grass	10
<i>nutans</i>		
<i>Elymus</i>	Canada Wild Rye	4
<i>canadensis</i>		
<i>Elymus</i>	Silky Wild Rye	10
<i>villosus</i>		
<i>Sporobolus</i>	Sand Dropseed	2
<i>cryptandrus</i>		

## INDIVIDUAL SPECIES

<i>Rhus</i>	Staghorn Sumac	2 lbs/acre
<i>typhina</i>		
<i>Eupatorium</i>	Joe Pye Weed	
<i>fistulosum</i>		
<i>E. maculatum</i>	Spotted Pye Weed	
<i>Helenium</i>	Common Sneezeweed	
<i>autumnale</i>		
<i>Oenothera</i>	Evening Primrose	
<i>biennis</i>		
<i>Parthenocissus</i>	Virginia Creeper	
<i>quinquefolia</i>		
<i>Asclepias</i>	Common Milkweed	
<i>syriaca</i>		
<i>A. tuberosa</i>	Butterfly Milkweed	

[Seed mixtures shall not contain millet or any other large-seed producing grass.]

## 2.1.3 Temporary Seed Species

Temporary seed species, for surface erosion control or overseeding, shall be broadcast at the direction of the Contracting Officer or the Contracting Officer's Representative only.

<u>Botanical Name</u>	<u>Common Name</u>	<u>Application Rate</u>
<i>Lolium multiflorum</i>	Annual Winter Rye	50lbs/acre

[Seed mixtures shall not contain millet or any other large-seed producing grass.]

#### 2.1.4 Quality

Weed seed shall be a maximum 1 percent by weight of the total mixture.

#### 2.1.5 Seed Mixing

The mixing of seed may be done by the seed supplier prior to delivery, or on site as directed.

#### 2.1.6 Substitutions

Substitutions will not be allowed without written request and approval from the Contracting Officer or the Contracting Officer's Representative.

### 2.2 MULCH

Mulch shall be free from weeds, mold, and other deleterious materials. Mulch materials shall be native to the region.

#### 2.2.1 Straw

Straw shall be stalks from oats, wheat, rye, barley, or rice, furnished in air-dry condition and with a consistency for placing with commercial mulch-blowing equipment.

#### 2.2.2 Hay

Hay shall be native hay, sudan-grass hay, broomsedge hay, or other herbaceous mowings, furnished in an air-dry condition suitable for placing with commercial mulch-blowing equipment.

#### 2.2.3 Wood Cellulose Fiber

Wood cellulose fiber used in hydroseeding shall not contain any growth or germination-inhibiting factors and shall be dyed an appropriate color to facilitate placement during application. Composition on air-dry weight basis: 9 to 15 percent moisture, pH range from 4.5 to 6.0.

### 2.3 WATER

Water shall be the responsibility of the Contractor, unless otherwise noted. Water shall not contain elements toxic to plant life.

### 2.4 EROSION CONTROL BLANKET

Erosion control blanket shall be in accordance with Section 01553 SOIL EROSION AND SEDIMENT CONTROL.

## PART 3 EXECUTION

### 3.1 INSTALLING SEED TIME AND CONDITIONS

#### 3.1.1 Seeding Time

The specified warm season grass mix should be broadcast as a dormant season seeding between September 30 and October 30. The warm season grass mix



germination rates are increased greatly if broadcast in the fall and allowed to stratify overwinter. The *Spartina* sp. seed can be broadcast seeded in the spring between May 15 and June 30 or as a dormant season seeding between September 15 and October 30.

### 3.1.2 Seeding Conditions

Seeding operations shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture, or other unsatisfactory conditions prevail, the work shall be stopped when directed. When special conditions warrant a variance to the seeding operations, proposed alternate times shall be submitted for approval.

### 3.1.3 Equipment Calibration

Immediately prior to the commencement of seeding operations, calibration tests shall be conducted on the equipment to be used. These tests shall confirm that the equipment is operating within the manufacturer's specifications and will meet the specified criteria. The equipment shall be calibrated a minimum of once every day during the operation. The calibration test results shall be provided within 1 week of testing.

### 3.1.4 Soil Test

Prior to placement of delivered sand as directed under Section 02233 EARTHWORK, the Contractor shall test no less than 5 samples of delivered sand in accordance with ASTM D 5268 and ASTM D 4972 to determine the pH, organic matter, soluble salts, and nutrient contents. Copies of the test results and testing laboratory qualifications shall be submitted to the Contracting Officer. Subsamples collected at 6 to 8 random locations in the sand stockpile shall be composited to create one test sample. New samples shall be collected and composited to create each test sample. The test shall determine the quantities and type of soil amendments required to meet local growing conditions for the seed species specified.

## 3.2 SITE PREPARATION

### 3.2.1 Finished Grade and Sand

The Contractor shall verify that finished grades are as indicated on drawings, and the placing of sand and smooth grading requirements have been completed in accordance with Section 02233 EARTHWORK, prior to the commencement of the seeding operation.

### 3.2.2 Wrack Removal

All wrack and debris that has collected in the low marsh, high marsh, and maritime transition areas prior to seeding shall be thoroughly removed and disposed of off-site. These areas shall be raked clean and smooth.

### 3.2.3 Soil Amendments

If required by the Contracting Officer or the Contracting Officer's Representative, soil amendments shall consist of pH adjuster, fertilizer, organic material and soil conditioners meeting the following requirements. Soil amendments shall be in accordance with Section 02237 PLANTING AND PLANT MAINTENANCE.

#### 3.2.3.1 pH Adjuster

If required by the Contracting Officer or the Contracting Officer's Representative, the pH adjuster shall be an agricultural liming material in accordance with ASTM C 602. These materials may be burnt lime, hydrated lime, ground limestone, or shells. The pH adjuster shall be used to create a favorable soil pH for the seed material specified.

#### 3.2.3.2 Fertilizer

Fertilizer shall be a natural, organic product containing mycorrhizal fungi, growth-promoting bacteria, bio-fertilizer, bio-stimulants, micronutrients and humate soil conditioners.

#### 3.2.3.3 Soil Conditioner

If needed soil conditioner shall be sand, super absorbent polymers, calcined clay, or gypsum for single use or in combination to meet topsoil requirements for the seed material specified.

#### 3.2.4 Debris

Debris and stones over 3 inch in any dimension shall be removed from the surface.

### 3.3 INSTALLATION

Prior to installing seed, any previously prepared surface compacted or damaged shall be reworked to meet the requirements of paragraph 3.2 SITE PREPARATION. Seeding operations shall not take place when the wind velocity will prevent uniform seed distribution.

#### 3.3.1 Installing Seed

Seeding method shall be broadcast seeding or hydroseeding. Seeding procedure shall ensure even coverage. Gravity feed applicators, which drop seed directly from a hopper onto the prepared soil, shall not be used because of the difficulty in achieving even coverage, unless otherwise approved. Absorbent polymer powder shall be mixed with the dry seed at the rate recommended by the manufacturer.

##### 3.3.1.1 Broadcast Seeding

Seed shall be mixed to ensure broadcasting at the rate of 0.57 pounds per 1000 square feet for Warm Season Native Seed Mix and 0.05 pounds per 1000 square feet for individual species seed, and 1.15 pounds per 1000 square feet for the Temporary Seed Species. Half the total rate of seed application shall be broadcast in 1 direction, with the remainder of the seed rate broadcast at 90 degrees from the first direction. Seed shall be covered a maximum 1/4 inch depth by disk harrow, steel mat drag, cultipacker, or other approved device.

##### 3.3.1.2 Hydroseeding

Seed shall be mixed to ensure broadcasting at the rate of 0.57 pounds per 1000 square feet for Warm Season Native Seed Mix and 0.05 pounds per 1000 square feet for individual species seed, and 1.15 pounds per 1000 square feet for the Temporary Seed Species. Seed and fertilizer shall be added to water and thoroughly mixed to meet the rates specified. The time period for the seed to be held in the slurry shall be a maximum 24 hours. [Wood cellulose

fiber mulch and tackifier shall be added at the rates recommended by the manufacturer after the seed, fertilizer, and water have been thoroughly mixed to produce a homogeneous slurry.] Slurry shall be uniformly applied under pressure over the entire area.

### 3.3.2 Mulching

#### 3.3.2.1 Hay or Straw Mulch

Hay or straw mulch shall be spread uniformly at the rate of 2 tons per acre. Mulch shall be spread by hand, blower-type mulch spreader, or other approved method. Mulching shall be started on the windward side of relatively flat areas or on the upper part of steep slopes, and continued uniformly until the area is covered. The mulch shall not be bunched or clumped. Sunlight shall not be completely excluded from penetrating to the ground surface. All seeded areas (temporary and permanent) shall be mulched on the same day as the seeding. Mulch shall be anchored immediately following spreading.

#### 3.3.2.2 Wood Cellulose Fiber, Paper Fiber, and Recycled Paper

Wood cellulose fiber, paper fiber, or recycled paper shall be applied as part of the hydroseeding operation. The mulch shall be mixed and applied in accordance with the manufacturer's recommendations.

### 3.3.3 Watering Seed

Watering shall be started immediately after completing the seeding of an area. Water shall be applied to supplement rainfall at a rate sufficient to ensure moist soil conditions to a minimum 1 inch depth. Run-off and puddling shall be prevented. Watering trucks shall not be driven over turf areas, unless otherwise directed. Watering of other adjacent areas or plant material shall be prevented.

## 3.4 SURFACE EROSION CONTROL

### 3.4.1 Surface Erosion Control Material

Where indicated or as directed, surface erosion control material shall be installed in accordance with manufacturer's instructions. Placement of the material shall be accomplished without damage to installed material or without deviation to finished grade in accordance with Section 01553 SOIL EROSION AND SEDIMENT CONTROL.

### 3.4.2 Temporary Seeding

The application rate shall be 50 pounds per acre. When directed during contract delays affecting the seeding operation or when a quick cover is required to prevent surface erosion, the areas designated shall be seeded in accordance with temporary seed species listed under Paragraph 2.1 SEED.

#### 3.4.2.1 Soil Amendments

When soil amendments have not been applied to the area, the quantity of  $\frac{1}{2}$  of the required soil amendments shall be applied and the area tilled in accordance with paragraph 3.2 SITE PREPARATION. The area shall be watered in accordance with paragraph 3.3.3 WATERING SEED.

#### 3.4.2.2 Remaining Soil Amendments

The remaining soil amendments shall be applied in accordance with the paragraph 3.2 SITE PREPARATION when the surface is prepared for installing seed.

### 3.5 QUANTITY CHECK

For materials provided in bags, the empty bags shall be retained for recording the amount used. For materials provided in bulk, the weight certificates shall be retained as a record of the amount used. The amount of material used shall be compared with the total area covered to determine the rate of application used. Differences between the quantity applied and the quantity specified shall be adjusted as directed.

### 3.6 RESTORATION AND CLEAN UP

#### 3.6.1 Restoration

Existing turf areas, pavements, and facilities that have been damaged from the seeding operation shall be restored to original condition at Contractor's expense.

#### 3.6.2 Clean Up

Excess and waste material shall be removed from the seeded areas and shall be disposed offsite. Adjacent paved areas shall be cleaned.

### 3.7 SEED ESTABLISHMENT PERIOD

#### 3.7.1 Commencement

The seed establishment period to obtain a healthy stand of plants for shall begin on the first day of seeding work under this contract and shall continue through the 3 year monitoring period, concluding three (3) months after the last day of the monitoring period as required by this contract. Written calendar time period(s) shall be developed jointly by the Contractor, the Contracting Officer, and/or the Contracting Officer's Representative. When there is more than 1 seed establishment period, the boundaries of the seeded area covered for each period shall be described. The plant establishment period may be modified to account for inclement weather shut down periods, or for separate completion dates for different areas.

#### 3.7.2 Satisfactory Stand of Plants

Plants shall be evaluated for species and health as soon as plant identification can be confirmed. A stand of plants shall be considered satisfactory when 85% cover is achieved after 2 full growing seasons. The Contractor shall guarantee seeded areas for 1 year from project completion.

#### 3.7.3 Maintenance During Establishment Period

Maintenance of the seeded areas shall include protecting embankments and ditches from surface erosion; maintaining erosion control materials and mulch; watering; and post-fertilization.

##### 3.7.3.1 Repair or Reinstall

Unsatisfactory stand of plants and mulch shall be repaired or reinstalled, and eroded areas shall be repaired in accordance with paragraph 3.2 SITE PREPARATION.

#### 3.7.3.2 Maintenance Record

A record of each site visit shall be furnished, describing the maintenance work performed; areas repaired or reinstalled; and diagnosis for unsatisfactory stand of grass plants.

-- End of Section --

## SECTION 02237

### PLANTING & PLANT MATERIAL MAINTENANCE

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## PART 1 GENERAL

## 1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

## AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A300 (1995) Tree Care Operations - Trees, Shrubs and Other Woody Plant Maintenance

## AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 602 (1995a) Agricultural Liming Materials

ASTM D 4972 (1995a) pH of Soils

D5435-93 (1998) Standard Test Method for Diagnostic Soil Test for Plant Growth and Food Chain Protection

## AMERICAN STANDARD FOR NURSERY STOCK

ANSI Z60.1 (2004) American Standard for Nursery Stock

## 1.2 MEASUREMENT AND PAYMENT

## 1.2.1 Payment Item No. 0011AA-C Plant Material

This item will be measured as the total number of plant material containers and plugs actually furnished. Planting areas are labeled as Maritime Scrub/Shrub, High Marsh, Intertidal/Interplanting Marsh, and Low Marsh on the Contract Drawings. The price bid shall be the UNIT PRICE per plant material container and plug furnished.

## 1.2.2 Payment Item No. 0011AD Plant Material Installation

For performing the work under this item, in accordance with Contract Drawings, specifications and directions of the Contracting Officer or the Contracting Officer's Representative, the Contractor shall receive a LUMP SUM. The LUMP SUM price bid shall include the cost of all labor, materials, and equipment necessary to install plant material within the areas shown on the Contract Drawings, and all work incidental thereto, in accordance with the Contract Drawings and specifications and to the satisfaction of the Contracting Officer and/or the Contracting Officer's Representative.

## 1.2.3 Payment Item No. 0011AE Soil Amendments

This item will be measured by the SQUARE YARD of surface area covered. The unit price bid per SQUARE YARD shall include the cost of soil amendments only. No measurement for payment shall be made for miscellaneous materials or equipment necessary for placement of the soil amendments. The price bid shall be the unit price per SQUARE YARD of soil amendments used during plant installation.

## 1.2.4 Payment Item No. 0011AF Mulch



This item will be measured by the SQUARE YARD of surface covered. The unit price bid per SQUARE YARD shall include the cost of mulch only. No measurement for payment shall be made for binder, dye or other miscellaneous materials or equipment necessary for placement of the mulch. The price bid shall be the unit price per SQUARE YARD of mulch used during plant installation.

#### 1.2.5 Payment Item No. 0011AG Mycorrhizal Fungal Inoculum

This item shall be measured by the GALLON of Mycorrhizal Fungal Inoculum applied. The unit price bid per GALLON shall include the cost of the Mycorrhizal Fungal Inoculum only. No measurement for payment shall be made for miscellaneous materials or equipment necessary for application of the mycorrhizal fungal inoculum.

Payment for the installation of the Erosion Control Blanket shall be made under Section 01553 SOIL EROSION AND SEDIMENT CONTROL.

#### 1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted to the Contracting Officer and/or the Contracting Officer's Representative in accordance with Section 01330 SUBMITTAL PROCEDURES:

##### SD-03 Product Data

Plant Material Order; G, A

Submit verification that plants have been ordered 6 months prior to the first day of planting.

Low Marsh Plants; G, A

High Marsh Plants; G, A

Maritime Scrub/Shrub Marsh Plants; G, A

pH Adjusters; G, A

Organic Material; G, A

Soil Conditioner; G, A

Submit data sheets and catalog cuts 30 calendar days prior to starting work. The data sheets shall show that materials meet the requirements specified herein. Data sheets shall include the following:

- a. Plants. Classification, botanical name, common name, size, root type, quantity by species, and growing location.
- b. pH adjusters. Calcium carbonate equivalent and sieve analysis.
- c. Organic material: Composition and source.
- d. Soil Conditioner: Composition and source.
- f. Organic Mulch: Composition, source, and treatment against fungi growth.
- g. Mycorrhizal Fungal Inoculum: Plant material treated.
- h. Pesticide and Herbicide Materials Safety Data Sheets (MSDS)

Delivery Schedule; G, A

Submit a delivery schedule at least 10 calendar days prior to

the first day of delivery.

Equipment; G, A

Submit a list of equipment to be used for the planting operation 3 days prior to starting work.

Finished Grade and Clean Sand; G, A

At least 24 hours prior to the commencement of planting operations, the Contractor shall submit verification that finished grades are as indicated on the Contract Drawings, and that the requirements for the placing of Clean Sand, smooth grading, and compaction have been met. The Contracting Officer or the Contracting Officer's Representative shall approve this submittal prior to commencement of planting operations.

#### SD-04 Samples

Soil Amendments; G, A

Submit 10 pound samples of any soil amendments to be used at least 15 calendar days prior to scheduled soil amendment delivery.

#### SD-06 Test Reports

Equipment Calibration; G, A

Within 1 week of testing, submit a certification of calibration tests conducted on the equipment used during the seeding operations.

Soils Test; G, RO

Submit certified reports of laboratory tests, prepared by an independent soil testing laboratory, including analysis and interpretation of test results. Each report shall be properly identified. Test methods used and compliance with recognized test standards shall be described. The Contractor shall be aware that the results of soils tests for the transition slope areas must be submitted prior to ordering shrubs in case high soluble salt levels necessitate a substitution for Bayberry (*Myrica pennsylvanica*).

Soil Amendments Testing; G, A

For bulk deliveries, submit a chemical analysis test at least 10 calendar days prior to scheduled soil amendment delivery.

#### SD-07 Certificates

One-year Plant Guarantee; G, A

Submit a signed one-year plant guarantee at least 30 calendar days prior to commencement of planting operations.

Testing Laboratory Qualifications; G, A

Submit qualifications of the commercial testing laboratory or Contractor's testing facilities when test reports are submitted.

#### SD-12 Schedules

Herbicide/Pesticide Treatment Plan; G, A

Submit herbicide/pesticide treatment plan with sequence of treatment work with date ranges and number of events. The application rate of active ingredients, method of application, area treated, amount

applied; and the name and state license number of the state certified applicator shall be included.

#### SD-13 Records

Maintenance Record; G, A

Submit a record describing maintenance work performed, the quantity of plant losses, diagnosis of the plant loss, and the quantity of replacements made on each site visit.

#### 1.4 Nurseries

The following nurseries specialize in growing wetland plant stock:

- a. Pinelands Nursery and Supply, Columbus, New Jersey  
(800) 667-2729
- b. Greenbelt Native Plant Center, Staten Island, New York  
(718) 667-2165
- c. Wild Earth Native Plant Nursery, Freehold, New Jersey  
(732) 308-9777
- d. Environmental Concern, St. Michaels, MD  
(410) 745-9620
- e. Ernst Conservation Seeds, Meadville, Pennsylvania  
(800) 873-3321

##### 1.4.1 Source Inspections

- a. The nursery or source of plant material shall be subject to inspection by the Contracting Officer or the Contracting Officer's Representative.
- b. All plant material delivered to the work site shall be subject to inspection and rejection by the Contract Officer or the Contracting Officer's Representative

#### 1.5 DELIVERY, INSPECTION, STORAGE, AND HANDLING

##### 1.5.1 Delivery

A delivery schedule shall be provided at least 10 calendar days prior to the first day of delivery.

###### 1.5.1.1 Plant Material Identification

Plant material shall be identified by scientific name and common name with attached, durable, waterproof labels and weather-resistant ink.

###### 1.5.1.2 Protection During Delivery

Plant material shall be protected during delivery to prevent desiccation and damage to the branches, trunk, root system, or earth ball. Branches shall be protected by tying-in. Exposed branches shall be covered during transport.

###### 1.5.1.3 Soil Amendments

Soil amendments, if required, shall be delivered to the site in the original, unopened containers bearing the manufacturer's chemical analysis. In lieu of containers, soil amendments may be furnished in bulk. A physical and chemical analysis shall be provided for bulk deliveries.

#### 1.5.1.4 Pesticide Material

Pesticide material, if required, shall be delivered to the site in the original, unopened containers bearing legible labels indicating the Environmental Protection Agency (EPA) registration number and the manufacturer's registered uses.

#### 1.5.2 Inspection

- a. Plant material shall be well shaped, vigorous and healthy with a healthy, well branched root system, free from disease, harmful insects and insect eggs, sun-scald injury, disfigurement or abrasion. Plant material shall be checked for unauthorized substitution and to establish nursery grown status.
- b. Plant material showing desiccation, abrasion, sun-scald injury, disfigurement, or unauthorized substitution shall be rejected. The plant material shall exhibit typical form of branch to height ratio; and meet the caliper and height measurements specified. Plant material that measures less than specified, or has been poled, topped off or headed back, shall be rejected. Container-grown plant material shall show new fibrous roots and the root mass shall contain its shape when removed from the container. Plant material with broken or cracked balls; or broken containers shall be rejected. Other materials shall be inspected for compliance with Part 2 PRODUCTS.
- c. Open soil amendment containers or wet soil amendments shall be rejected. Unacceptable material shall be removed from the job site.

#### 1.5.3 Storage

##### 1.5.3.1 Plant Material Storage

Plant material not installed on the day of arrival at the site shall be stored and protected in designated areas. Plant material shall not be stored longer than 30 days. Plant material shall be protected from over exposure to wind, rain and sun. Plant material shall also be protected from herbivory or other predation prior to and after planting. All plant material shall be kept in a moist condition by watering with a fine mist spray until installed. At no time shall any plant material be stored or staged in existing tidal wetland areas or on Keyspan property other than as shown on the contract drawings or as directed by the Contracting Officer or the Contracting Officer's Representative.

##### 1.5.3.2 Other Material Storage

Storage of other materials and/or equipment shall be in designated areas as shown on the contract drawings or as directed by the Contracting Officer or the Contracting Officer's Representative. At no time shall any materials or equipment be stored or staged in existing tidal wetland areas or on Keyspan property other than as shown on the contract drawings or as directed by the Contracting Officer or the Contracting Officer's Representative. Soil amendments shall be stored in dry locations and away from contaminants. Appropriate measures to prevent erosion shall be applied to any stockpiles of soil amendments. Chemical treatment material shall be stored according to manufacturer's instructions and not with planting operation material.

#### 1.5.4 Handling

Plant material shall not be injured during handling. Containerized material shall be freed from the container with care and the root ball gently loosened

prior to planting. Plant material shall not be handled by the trunk or stems. Materials shall not be dropped from vehicles.

#### 1.5.5 Time Limitation

Except for container-grown plant material, the time limitation from digging to installing plant material shall be a maximum 5 days. The time limitation between installing the plant material and placing the mulch shall be a maximum 24 hours.

#### 1.6 ONE-YEAR PLANT GUARANTEE

The Contractor shall submit to the Contracting Officer or the Contracting Officer's Representative, a written and signed one-year plant guarantee, which is conditional of 90 percent survival of the planted Contract quantity as detailed on the plans. Planting areas or portions thereof for which 85 percent survival is not reached shall be replanted once during the appropriate planting season for the planting area, to achieve a minimum of 85 percent of the planted Contract quantity.

The one-year plant guarantee period shall commence on the date of the completion of construction, and shall end 365 calendar days later. The Contractor shall provide the commencement and ending dates as part of the Periodic Schedule Updates and Progress Curves submitted under Section 01320 PROJECT SCHEDULE. Following are the terms and conditions of the one-year plant guarantee:

- a. Waterfowl Exclusion Fence will be installed as described in Section 02238 FENCING.
- b. Plants will meet the requirements listed in PART 2 PRODUCTS.
- c. Planting operations will be carried out as stipulated herein.

Under the terms and conditions of the one-year plant guarantee, the Contractor shall be solely responsible for plant survival. Losses attributed to herbivores, disease, inappropriate hydrological regimes, drought, or wind shall not lower the minimum survival or coverage requirements.

At the end of the first growing season (fall following original planting) and the one-year plant guarantee, the Contracting Officer or the Contracting Officer's Representative shall make a determination as to whether the plants planted in the planting areas meet the conditions of the guarantee. Any planting areas or portions thereof not meeting the requirements of the guarantee shall be replanted in accordance with the paragraph REPLANTING.

### PART 2 PRODUCTS

#### 2.1 PLANT MATERIAL

##### 2.1.1 Plant Material Classification

The plant material shall be nursery grown stock conforming to American Nursery and Landscape Association (ANLA) standards and shall be the species specified on the construction drawings. No substitutions shall be permitted without the express written consent of the Contracting Officer or the Contracting Officer's Representative.

##### 2.1.2 Plant Schedule

No later than forty-five (45) days prior to the estimated planting date the Contractor shall submit to the Contracting Officer and/or the Contracting Officer's Representative two (2) copies of an Estimated Planting Schedule for review and approval. The estimated planting schedule shall include plant shipping dates, designated delivery point(s), planting dates for each shipment and estimated planting crew sizes. The estimated planting schedule shall also provide botanical names, in accordance with the list of Standard Plant Names adopted by the American Joint Committee on Horticultural Nomenclature, quantities and conditions. The plant schedule shall also provide the source of all plant material delivered to the project site.

#### 2.1.3 Substitutions

Substitutions will not be permitted without written request and approval from the Contracting Officer and/or the Contracting Officer's Representative.

#### 2.1.4 Quality

Well shaped, well grown, vigorous plant material having healthy and well branched root systems in accordance with ANLA standards shall be provided. Plant material shall be provided free from disease, harmful insects and insect eggs, sun-scald injury, disfigurement and abrasion. Plant material shall be free of shock or damage to branches, trunk, or root systems, which may occur from the digging and preparation for shipment, method of shipment, or shipment. Plant quality is determined by the growing conditions; method of shipment to maintain health of the root system; and growth of the trunk and crown as follows.

#### 2.1.5 Plant Source & Growing Conditions

The Contractor shall purchase plant material from a nursery source approved by the NRCS Plant Materials Center, Cape May, NJ. Plants shall be nursery grown from stock or seed collected within 150 miles of the project site. Plant material shall be native to or well-suited to the growing conditions of the project site.

Plant material shall be grown under climatic and hydrologic conditions similar to those found at the project site. The salinities observed in Old Place Creek ranged from 1.0 to 14.65 ppt with an average salinity of 4.48 ppt. To avoid salt shock all stock shall be acclimated to the salinity concentration indicated in this paragraph and as shown on the contract drawings. Acclimation shall be described as growing at the prescribed salinity concentrations for a minimum period of two (2) weeks prior to shipment of the stock to the project site. The nursery or nurseries should be made aware of the acclimatization requirements and that it may take several weeks.

#### 2.1.6 Method of Shipment to Maintain Health of Root System

##### 2.1.6.1 Container-Grown Plant Material

Container size shall be in accordance with ANLA standards. Plant material shall be grown in a container over a duration of time for new fibrous roots to have developed and for the root mass to retain its shape and hold together when removed from the container. Container-grown plant material shall be inoculated with mycorrhizal fungi during germination in the nursery. The container shall be sufficiently rigid to hold ball shape and protect root mass during shipping.

#### 2.1.7 Deciduous Shrubs and Trees

Deciduous shrubs and trees shall have the height and number of primary stems recommended by ANLA. Acceptable plant material shall be well shaped, with sufficient well-spaced side branches, and recognized by the trade as typical for the species grown in the region of the project.

#### 2.1.8 Herbaceous Plugs/Peat Pots

Herbaceous plugs shall be grown in 2" x 2" peat pots long enough for the root system to be well enough developed through the sides and bottom of the pots to prevent removal of the plant when submerged in water. The plant material in each plug shall be a minimum of twelve (12) inches in height. Each plug shall possess a minimum of 4 sprigs and/or shall conform to ANLA standards. Herbaceous plugs shall be delivered to the site in flats labeled with the scientific and common name.

#### 2.1.9 Plant Material Size

Plant material shall be furnished in sizes and condition as indicated on the Construction Drawings. Plant material larger in size than specified may be provided at no additional cost to the Government. Undersized stock or material not conforming to the specifications, as solely determined by the Contracting Officer and/or the Contracting Officer's Representative may be rejected at the source, at the time of delivery, installation or acceptance without any compensation.

#### 2.1.10 Plant Material Measurement

Plant material measurements shall be in accordance with ANLA standards.

### 2.2 SOIL AMENDMENTS

If required by the Contracting Officer or the Contracting Officer's Representative, soil amendments shall consist of pH adjuster and fertilizer meeting the following requirements. Vermiculite is not recommended.

#### 2.2.1 pH Adjuster

If required by the Contracting Officer or the Contracting Officer's Representative, the pH adjuster shall be an agricultural liming material in accordance with ASTM C 602. These materials may be burnt lime, hydrated lime, ground limestone, or shells. The pH adjuster shall be used to create a favorable soil pH for the plant material specified.

##### 2.2.1.1 Limestone

If required by the Contracting Officer or the Contracting Officer's Representative, limestone material shall contain a minimum calcium carbonate equivalent of 80 percent. Gradation: A minimum 95 percent shall pass through a 2.36 mm No. 8 sieve and a minimum 55 percent shall pass through a 0.25 mm No. 60 sieve. To raise soil pH, ground limestone shall be used.

##### 2.2.1.2 Hydrated Lime

If required by the Contracting Officer or the Contracting Officer's Representative, hydrated lime shall contain a minimum calcium carbonate equivalent of 110 percent. Gradation: A minimum 100 percent shall pass

through a 2.36 mm No. 8 sieve and a minimum 97 percent shall pass through a 0.25 mm No. 60 sieve.

#### 2.2.1.3 Burnt Lime

If required by the Contracting Officer or the Contracting Officer's Representative, burnt lime shall contain a minimum calcium carbonate equivalent of 140 percent. Gradation: A minimum 95 percent shall pass through a 2.36 mm No. 8 sieve and a minimum 35 percent shall pass through a 0.25 mm No. 60 sieve.

#### 2.2.2 Organic Material

Organic material shall consist of recycled compost only.

##### 2.2.2.1 Recycled Compost

Compost shall be from a well decomposed, stable, weed free organic matter source. Compost shall possess no objectionable odors and shall not resemble the raw material from which it was derived. The material shall not contain substances toxic to plants.

The compost material shall pass through a 3/8 inch screen, possess a pH of 5.5 to 8.0, and have a moisture content between 35 to 55 percent by weight. The material shall not contain more than 1 percent by weight of man-made foreign matter. Compost shall be cleaned of plastic materials larger than 2 inches in length.

#### 2.2.3 Fertilizer

Each plug shall be fertilized at the time of planting with a 30-gram (1 oz.) subsurface application of Meister 23-6-10, granular 5- to 6-month controlled release fertilizer. An approved substitute is Osmocote 22-4-9, granular 5- to 6-month controlled release fertilizer.

Meister 23-6-10, granular 5- to 6-month controlled release fertilizer as manufactured by the Helena Chemical Company, 510 Heron Drive, Bridgeport, NJ. 08014.

Osmocote 22-4-9, granular 5- to 6-month controlled release fertilizer as manufactured by Sierra Chemical Company, Milpitas, CA 95035.

#### 2.3 MULCH

The root crown of all woody plants shall be mulched no longer than 24 hours after planting. Mulch shall be free from weeds, mold, and other deleterious materials. Mulch materials shall be native to the region. Rotted manure is not recommended to be used as a mulch because it would encourage surface rooting of the plant material and weeds.

All mulch is to be organic in origins and composition. Organic mulch materials shall be native to the area and or the project site but must not include any invasive or exotic species including but not limited to Common Reed (*Phragmites australis*), Tree-of-heaven (*Ailanthus altissima*) and Mugwort (*Artemisia vulgaris*). Organic mulch may consist of shredded bark, wood chips, or ground bark.

##### 2.3.1 Shredded Hardwood Bark



Locally shredded material shall be treated to retard the growth of mold and fungi. Any locally shredded materials must not include any invasive or exotic species including but not limited to Common Reed (*P. australis*), Tree-of-heaven (*A. altissima*) and Mugwort (*A. vulgaris*).

#### 2.4 EROSION CONTROL BLANKET

Erosion control blanket shall be installed over the low marsh and high marsh areas as shown on the contract drawings. The fabric shall be installed after securing approvals on the finish grade as-built topography and after the salt marsh cord grass seed is broadcast. Erosion control blanket shall be installed at finish grade and shall consist of machine twisted bristle coir twine that is reinforced with two UV stabilized polypropylene strands in the middle blanket (i.e. Rolanka BioND100 or approved equal). The strands shall move independently eliminating potential wildlife entrapment. The mesh size shall be no smaller than 0.5 x 0.5 inches so as to be large enough not to prevent or hamper emergence. It shall be made specifically for use as a fabric around plant material subject to tidal inundation. Erosion control blanket shall be installed and anchored in accordance with the manufacturer's specifications. Erosion control blanket shall be anchored with wooden or other 100% biodegradable stakes.

#### 2.5 MYCORRHIZAL FUNGAL INOCULUM

Mycorrhizal fungal inoculum shall be composed of multiple-fungi inoculum as recommended by the manufacturer for the plant material specified. Mycorrhizal fungal inoculum shall be combined with organic soil amendments as indicated in paragraph 2.2.2. Mycorrhizal fungal inoculum shall conform to the following product specification (e.g. Mycor TreeSaver or PlantSaver or approved equal):

Potassium polyacrylamide hydrogel.....	33%
Kelp Meal.....	23%
Green sand.....	22%
Granular Humate.....	15%
9.6% Humic Acids	
Extract of <i>Yucca schidigera</i> .....	1.5%
Inert Ingredients.....	5.5%
VAM Fungi.....	5300 spores*/Lb
1325 spores/Lb <i>Entrophospora columbiana</i>	
1325 spores/Lb <i>Glomus clarum</i>	
1325 spores/Lb <i>Glomus etunicatum</i>	
1325 spores/Lb <i>Glomus intraradices</i>	
Ectomycorrhizal Fungi.....	95 Million spores/Lb
95 Million <i>Pisolithus tinctorius</i> spores/Lb	

\*Fungal counts represent only spores, and do not refer to root fragments or other nonspore propagules.

#### 2.6 WATER

Unless otherwise directed, water shall be the responsibility of the Contractor. Water shall not contain elements toxic to plant life. The contractor shall be responsible for watering at regular intervals throughout the maintenance period. Water to supplement rainfall shall be applied at a rate sufficient to ensure plant growth. Run-off and puddling shall be prevented. Watering trucks shall not be driven within the restoration area,

unless otherwise directed by the Contracting Officer or the Contracting Officer's Representative. Watering of other adjacent areas or plant material shall be prevented.

## 2.7 PESTICIDE

Pesticide shall be insecticide, fungicide, nematocide, rodenticide or miticide. For the purpose of this specification a soil fumigant shall have the same requirements as a pesticide. The pesticide material shall be EPA registered and approved.

## 2.8 HERBICIDE

Herbicide shall be an EPA registered systemic herbicide approved for use in aquatic environments and application for *Phragmites australis* control and complying with Federal Insecticide, Fungicide, and Rodenticide Act (Title 7 U.S.C. Section 136) for requirements on Contractor's licensing, certification, and record keeping. Contractor shall keep records of all pesticide applications and forward data monthly to Contracting Officer or the Contracting Officer's Representative. Record keeping format shall be submitted to Contracting Officer or the Contracting Officer's Representative for approval.

## PART 3 EXECUTION

### 3.1 INSTALLING PLANT MATERIAL TIME AND CONDITIONS

#### 3.1.1 Plant Material Installation Windows

Woody material shall be installed during spring and/or fall planting window. For deciduous woody plants, the Spring window shall be defined as March 1 through May 1; the fall planting window shall be defined as September 15 - December 1. For evergreen woody plants, the Spring window shall be defined as April 1 through May 15; the fall planting window shall be defined as September 15 through October 15.

Herbaceous plant material shall be installed between May 15 and June 30. Herbaceous plant material installation outside this window may only occur with the written approval of the Contracting Officer in consultation with the Contracting Officer's Representative.

*Spartina alterniflora*, *S. patens* and *Distichlis spicata* shall be installed and seed broadcast specifically between May 15 and June 30. A dormant season seeding of these species may be broadcast between September 30 and October 30 in accordance with section 02236 SEEDING.

#### 3.1.2 Conditions for Plant Material Installation

Planting operations shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture, frozen ground or other unsatisfactory conditions prevail, the work shall be stopped when directed. When special conditions warrant a variance to the planting operations, proposed planting times shall be submitted for approval to the Contract Officer or the Contracting Officer's Representative.

#### 3.1.3 Tests

##### 3.1.3.1 Soil Test

Prior to placement of delivered sand as directed under Section 02233 EARTHWORK, the Contractor shall test no less than 5 samples of delivered sand in accordance with ASTM D 5268 and ASTM D 4972 to determine the pH, organic matter, soluble salts, and nutrient contents. Copies of the test results and testing laboratory qualifications shall be submitted to the Contracting Officer or the Contracting Officer's Representative. Subsamples collected at 6 to 8 random locations in the sand stockpile shall be composited to create one test sample. New samples shall be collected and composited to create each test sample. The test shall determine the quantities and type of soil amendments required to meet local growing conditions for the plant species specified.

### 3.2 SITE PREPARATION

#### 3.2.1 Finished Grade, Clean Sand-Imported and Underground Utilities

Coordinate the placement of clean sand-imported with Section 02233 EARTHWORK.

The Contractor shall verify that finished grades are as indicated on the contract drawings, and that the placement of clean sand, the smooth grading, and the compaction requirements have been completed in accordance with Section 02233 EARTHWORK, prior to the commencement of the planting operations. The location of underground utilities, high-pressure mains and facilities in the area of the planting operation shall be verified. Damage to underground utilities and facilities shall be repaired at the Contractor's expense.

#### 3.2.2 Placing Erosion Control Blanket

Erosion control blanket shall be installed over the low marsh and high marsh areas as indicated on the contract drawings and Section 01553 Soil Erosion and Sediment Control. The fabric shall be installed after the finish grade as-built topography has been approved and prior to planting salt marsh cord grasses.

#### 3.2.3 Layout

Plant material locations shall be staked on the project site before planting commences. Plant material locations may be adjusted to meet field conditions. The Contracting Officer, upon consultation with the Contracting Officer's Representative shall inspect and approve the planting layout prior to planting.

#### 3.2.4 Wrack Removal

All wrack and debris that has collected in the low marsh, high marsh, and tidal shrub marsh areas prior to planting shall be thoroughly removed and disposed of off-site. These areas shall be raked clean and smooth.

#### 3.2.5 Protecting Existing Vegetation

Existing trees, shrubs, and plant beds that are to be preserved shall be protected from climatic extremes (including desiccation) and herbivory to protect them prior to planting operations.

### 3.3 PLANT INSTALLATION

#### 3.3.1 Obstructions Below Ground

When obstructions below ground affect the work, shop drawings showing proposed adjustments to plant material location, type of plant and planting method shall be submitted for approval.

### 3.3.2 Plant Pits

Plant pits for container plant material shall be dug to 1.5 times the height of the root ball and refilled with the loosened soil to a depth equal to the height of the root ball (root ball height is measured from the base of the ball to the base of the plant stem or trunk).

### 3.3.3 Setting Maritime Scrub/Shrub Plant Material

Maritime scrub/shrub plant material shall be set plumb and held in position until sufficient soil has been firmly placed around root system or ball. In relation to the surrounding grade, the plant material shall be set even with the grade at which it was grown. The plant material shall be set in such a way as the root crown in one to three (1-3) inches below the finish grade surface after back filling.

### 3.3.4 Setting Salt Marsh Grass Plugs

All salt marsh grasses (*S. alterniflora*, *S. patens*, *D. spicata*) specified for the low marsh and high marsh shall be installed through the erosion control fabric. A three sided square flap shall be cut from the fabric and then split down the middle. A planting hole will then be excavated to accommodate the 2" x 2" plugs. The plugs should then be set in the hole and backfilled with surrounding sand/soil such that the root crown is covered by approximately one inch of material. Then the erosion control fabric flap is secured around the stems of the plug.

### 3.3.5 Backfill Soil Mixture for Maritime Scrub/Shrub Plant Material

The backfill soil mixture may be a mix of sand and soil amendments suitable for the plant material specified. When practical, the excavated soil from the plant pit that is not amended provides the best backfill and shall be used provided that it is free of invasive/exotic root or rhizome material, especially that originating from *Phragmites australis*.

#### 3.3.5.1 Adding Mycorrhizal Fungal Inoculum

Mycorrhizal fungal inoculum shall be added to maritime scrub/shrub area plantings at an application rate of 3 ounces for each 1 foot diameter of root ball in each planting hole prior to backfilling.

#### 3.3.5.2 Backfill Procedure

The plant material shall be carefully removed from containers that are not biodegradable. Prior to setting the plant in the pit, a maximum 1/4 depth of the root mass, measured from the bottom, shall be carefully spread apart to promote new root growth. For plant material in biodegradable containers the container shall be split prior to setting the plant with container. Backfill mixture shall be added to the plant pit in six (6) inch layers with each layer lightly tamped.

#### 3.3.5.3 Berm

An earthen or mulch berm, consisting of backfill soil mixture, soil mixture and mulch or mulch shall be formed with a minimum four (4) inch height around

the edge of the plant pit to aid in water retention, to prevent excessive water loss due to evaporation and to provide soil for settling adjustments.

#### 3.3.6 Watering

Plant pits and plant beds shall be watered immediately after backfilling, until completely saturated.

### 3.4 FINISHING

#### 3.4.1 Plant Material

Prior to placing mulch, the installed area shall be uniformly edged to provide a clear division line between the planted area and the adjacent Keyspan Facility setback, as indicated on the contract drawings. The installed area shall be raked and smoothed while maintaining the earth berms.

#### 3.4.2 Placing Mulch

The placement of mulch shall occur a maximum 24 hours after planting. Mulch, used to reduce soil water loss, regulate soil temperature and prevent weed growth, shall be spread to cover the installed area with a minimum four (4) inch uniform thickness. Mulch shall be kept out of the crowns of shrubs and ground cover, and shall be kept off sidewalks and other facilities.

#### 3.4.3 Pruning

Pruning shall be accomplished by trained and experienced personnel. The pruning of trees shall be in accordance with ANSI - A 300. Only dead or broken material shall be pruned from installed plants. The typical growth habit of individual plant material shall be retained. Clean cuts shall be made flush with the parent trunk. Improper cuts, stubs, dead and broken branches shall be removed. "Headback" cuts at right angles to the line of growth will not be permitted. Trees shall not be poled or the leader removed, nor shall the leader be pruned or "topped off".

### 3.5 MAINTENANCE DURING PLANTING OPERATION

Installed plant material shall be maintained in a healthy growing condition. Maintenance operations shall begin immediately after each plant is installed to prevent desiccation and shall continue until the plant establishment period commences. Installed areas shall be kept free of weeds, grass, and other undesired vegetation. The maintenance includes maintaining the mulch, watering, and adjusting settling. The maintenance may also include the spot application of a systemic herbicide to prevent the re-establishment of invasive/exotic species. Any herbicide application will be conducted to prevent collateral damage to planted or native species. Any damage to native or planted species inflicted during herbicide application shall be corrected at the Contractor's expense. The Contractor shall maintain all plant material for a period of 1 year from project completion, in accordance with the requirements outlined in paragraph 3.9 Plant Establishment Period, and must meet a performance standard of 85% aerial cover of native plant or native salt marsh and maritime scrub/shrub plant species.

### 3.6 APPLICATION OF PESTICIDE

Pesticide shall only be applied when given express written permission by the

Contracting Officer or the Contracting Officer's Representative. When application of a pesticide becomes necessary to remove a pest or disease, a pesticide treatment plan shall be submitted and coordinated with the installation pest management program.

#### 3.6.1 Technical Representative

The certified installation pest management coordinator shall be the technical representative, and shall be present at all meetings concerning treatment measures for pest or disease control. They may be present during treatment application.

#### 3.6.2 Application

A New York State Department of Environmental Conservation (DEC) certified applicator shall apply required pesticides in accordance with EPA label restrictions and recommendations. Clothing and personal protective equipment shall be used as specified on the pesticide label. A closed system is recommended as it prevents the pesticide from coming into contact with the applicator or other persons. Water for formulating shall only come from designated locations. Filling hoses shall be fitted with a backflow preventer meeting local plumbing codes or standards. Overflow shall be prevented during the filling operation. Prior to each day of use, the equipment used for applying pesticide shall be inspected for leaks, clogging, wear, or damage. Any repairs are to be performed immediately.

#### 3.7 CLEAN UP

Excess and waste material shall be removed from the restoration area and shall be properly disposed offsite at the Contractor's expense. Excess sediment from excavations must be properly disposed of according to all local, state and federal regulations. Any adjacent paved areas including Gulf Avenue and its sidewalks shall be cleared.

#### 3.8 REPLANTING

All plant materials under this Contract that are unsightly, unhealthy, dead, excessively pruned, lost their natural shape due to dead branches, or not in a vigorous, thriving condition, as determined by the Contracting Officer, during and at the end of the guarantee period, shall be removed promptly from the site. These, and any other plants missing due to the Contractor's negligence, shall be replaced and/or added as conditions permit, during the normal planting season(s). If any questions arise regarding the condition and satisfactory establishment of a rejected plant, the Contractor may elect to allow such a plant to remain through another complete growing season, at which time the rejected plant, if found to be dead, in an unhealthy or badly impaired condition, shall be replaced. Replanted material shall be given a six (6) month guarantee, beginning at the time of preliminary acceptance of the replanted material.

For non-surviving plants, the Contracting Officer or the Contracting Officer's Representative shall select the species to be replanted. The new plantings shall comply with the original Contract quantities as shown on the plans, as solely determined by the Contracting Officer. Materials and installation shall be in accordance with the materials specifications and the paragraph PLANT INSTALLATION, respectively.

At the direction of the Contracting Officer, the Contractor shall install and maintain additional Waterfowl Exclusion Fence around the replanted areas in

accordance with Section 02821 FENCING.

All labor, materials, equipment, and incidentals necessary to complete any replanting work associated with the one-year plant guarantee shall be at no additional cost to the Government.

### 3.9 PLANT ESTABLISHMENT PERIOD

#### 3.9.1 Commencement

The plant establishment period for maintaining plantings in a healthy growing condition shall commence on the first day of planting work under this contract. The plant establishment period shall continue through the one (3) year from project completion warranty period as required by this contract. Written calendar time period(s) for the plant establishment period shall be developed jointly by the Contractor and the Contracting Officer. When there is more than one plant establishment period, the boundaries of the planted area covered for each period shall be described. The plant establishment period shall be coordinated with Section 02921 SEEDING. The plant establishment period may be modified to account for inclement weather shut down periods, or for separate completion dates for different areas.

##### 3.9.1.1 General Requirements

Plant material shall be maintained as well shaped, well grown, vigorous plant material having healthy root systems. The plant material shall be maintained as free from disease, harmful insects and insect eggs, sun-scald injury, disfigurement and abrasion. Plant material shall be free of shock or damage to branches, trunk, or root systems.

#### 3.9.2 Maintenance During Plant Establishment Period

Maintenance of plant material shall include straightening plant material, supplementing mulch; pruning dead or broken branch tips; maintaining plant material labels; watering; eradicating weeds, insects and disease; post-fertilization; and removing and replacing unhealthy plants.

##### 3.9.2.1 Watering Plant Material

The plant material shall be watered as necessary to prevent desiccation and to maintain an adequate supply of moisture within the root zone. An adequate supply of moisture is estimated to be the equivalent of 1 inch absorbed water per week, delivered in the form of rain or augmented by watering. Run-off, puddling and wilting shall be prevented. Unless otherwise directed, watering trucks shall not be driven within the restoration areas. Watering of other adjacent areas or existing plant material shall be prevented.

##### 3.9.2.2 Weeding

Maintenance must prevent the reestablishment of invasives. Grass and weeds in the installed areas shall not be allowed to reach a maximum three (3) inches height before being completely removed, including the root system. No *P. australis* or *Polygonum cuspidatum* shall occur on site for at least one year prior to end of the maintenance period. *Phragmites australis* shall be controlled post planting by hand applying RODEO (or approved equal) via a backpack sprayer or by hand wicking to mature plants. Herbicide shall be applied in such a way as to prevent collateral damage to any planted or native species within or outside the restoration area. As *P. australis* grows

chiefly from rhizome, the most effective time period to apply a systemic herbicide such as RODEO is between August 30 and October 15 when the plants are translocating resources down to the rhizome in preparation for dormancy.

#### 3.9.2.3 Pesticide Treatment

Treatment for disease or pest shall be in accordance with paragraph 3.6 APPLICATION OF PESTICIDE.

#### 3.9.2.4 Post-Planting Soil Amendments

Post planting Soil Amendments shall only be applied at the direction of the Contracting Officer or the Contracting Officer's Representative. Application rates would be in accordance with the manufacturer's specifications. Application shall be timed prior to the advent of winter dormancy and performed without burning plants.

#### 3.9.2.5 Plant Pit Settling

When settling occurs to the backfill soil mixture, additional backfill soil shall be added to the plant pit or plant bed until the backfill level is equal to the surrounding grade. Serious settling that affects the setting of the plant in relation to the maximum depth at which it was grown requires replanting in accordance with paragraph 3.3 INSTALLATION. The earth berm shall also be maintained.

#### 3.9.2.6 Maintenance Record

A record shall be furnished describing the maintenance work performed, the quantity of plant losses, diagnosis of the plant loss, and the quantity of replacements made on each site visit.

#### 3.9.3 Unhealthy Plant Material

A tree shall be considered unhealthy or dead when the main leader has died back, or up to a maximum 25 percent of the crown has died. A shrub shall be considered unhealthy or dead when up to a maximum 25 percent of the plant has died. This condition shall be determined by scraping on a branch an area 1/16 inch square, maximum, to determine if there is a green cambium layer below the bark. The Contractor shall determine the cause for unhealthy plant material and shall provide recommendations for replacement. Unhealthy or dead plant material shall be removed immediately and shall be replaced as soon as seasonal conditions permit.

#### 3.9.4 Replacement Plant Material

Unless otherwise directed, plant material shall be provided for replacement in accordance with paragraph 2.1 PLANT MATERIAL. Replacement plant material shall be installed in accordance with paragraph 3.3 INSTALLATION, and recommendations in paragraph 3.9 PLANT ESTABLISHMENT PERIOD. Plant material shall be replaced in accordance with paragraph 1.5 WARRANTY. The plant establishment period for the replacement plant material shall be a minimum of six months.

-- End of Section --





SECTION 02238  
WILDLIFE MANAGEMENT  
(Waterfowl Exclusion System)

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## PART 1 GENERAL

### 1.1 SCOPE OF WORK

Under this Item, the work shall consist of installation and maintenance of a temporary waterfowl exclusion fence around the perimeter and throughout the the restored salt marsh planting areas as shown on the contract drawings. The system shall serve to discourage waterfowl from grazing on newly planted marsh grasses.

### 1.2 MEASUREMENT AND PAYMENT

#### 1.2.1 Payment Item No. 0012 Wildlife Management (Waterfowl Exclusion System)

The quantity of waterfowl exclusion fence furnished and incorporated into the work shall be the number of LINEAR FEET of the perimeter of each cell installed, including the cost of all labor, materials, and equipment required to install and maintain the barrier around the salt marsh planting area as shown on the Contract Drawings. Double payment will not be made for adjacent cell perimeters. At no time should planted or unplanted herbaceous material be left unprotected from predation. Any damage to planted or unplanted material that is left unprotected shall be replaced at the Contractor's expense.

The price bid shall be a unit price per LINEAR FOOT of waterfowl exclusion fence, including all labor, materials, equipment, and incidentals necessary to complete the work from installation to maintenance and removal, in accordance with the details and Contract Drawings, to the satisfaction of the Contracting Officer or the Contracting Officer's Representative.

## PART 2 PRODUCTS

### 2.1 MATERIALS

Unless otherwise herein specified, all materials and methods of construction shall conform with the contract drawings and the Materials and Methods of Construction as presented herein.

The fence shall be made of the following materials, as shown in the detail:  
Fence Posts: 2" x 2" x 10' stakes of pointed tipped, untreated hardwood lumber. Stakes shall be free from large knots that weaken the strength of the stake.

Coir twine: braided coir twine line #18 gauge cord with tensile strength of 150 pounds.

Mylar flagging: Silver and red metalized plastic tape, 1 1/4" wide made of recyclable polyethylene (Birdscare Flash Tape, Modern Agri-Products, 410 First Street, Lynden Washington 98264 or approved equal)

Construction Fencing: Tensar BX205 orange plastic snow fencing, or approved equal, with vertical and horizontal mesh.

Nails: 2" hot dipped galvanized roofing nails.

U-Nails: 1 1/2 " hot dipped galvanized u-nails.

## PART 3 EXECUTION

## 3.1 METHOD

The waterfowl barrier fence shall be installed after finish grades in the planting area are completed, salt marsh cord grass seed has been broadcast and geotextile fabric has been installed and approved by the Contracting Officer or the Contracting Officer's Representative. Planting shall occur concurrent with or after the waterfowl barrier is installed. At no time should planted or unplanted herbaceous material be left outside the barrier, unprotected from predation. Any damage to planted or unplanted material that is left unprotected shall be replaced at the Contractor's expense.

Prepare the wood stakes by measuring out a template stake with roofing nails spaced 8 inches apart or as specified in the Contract Drawings. Use template stakes such as this to ensure consistency of spacing for nails on all stakes used in waterfowl barrier fence. Pre-nail all stakes prior to driving them vertically into marsh substrate.

Vertical wood stakes shall be spaced along the perimeter and throughout the planting area as indicated on the Contract Drawings. Stakes shall be pounded vertically into the marsh substrate to a depth of two and a half (2 1/2) feet. The planting area shall be divided into sections or cells approximately twenty-five (25) feet by twenty-five (25) feet by single rows of vertical stakes. The fence shall be installed a minimum of eighteen (18) inches away from the first row of wetland planting so that the plants fall within the waterfowl exclusion system.

After a section or "cell" of stakes have been installed, a panel four (4) feet wide by twenty-five (25) feet long of orange construction safety fence shall be fastened to the stakes with u-nails, as shown on the contract drawings. The bottom edge of the orange safety fence shall be set 4-inches below finish grade. The safety fence shall be securely and permanently fastened to the stakes. Cable ties or similar fastener are not an acceptable substitute as they allow the fence to slip down the stakes.

Parallel rows of coir twine shall be strung horizontally, above the orange fence, between the stakes as shown on the contract drawings. Ends of twine shall be tied securely to the first nail and strands secured to subsequent nails with a clove hitch or similar knot. This line is to prevent Canada geese from entering the planting area during flood tides. It is critical that there be no gaps greater than four (4) inches between strands of twine and/or the top of the safety fence.

Upon completion of the outer perimeter of each section or cell, if needed to stabilize the stringing over the top of each cell, one (1) to two (2) stakes shall be pounded into the marsh substrate in the middle of the cell as shown in Contract Drawings. These stakes shall be evenly spaced apart in the middle of the cell as shown in the drawings. Coir twine shall be strung horizontally across the top of the planting area in a pattern as shown on the Contract Drawings. The grid created by the coir twine shall be narrow enough to prevent Canada geese and ducks from entering. Interior lines shall be securely attached to the tops of stakes with u-nails. Stringing of interior lines may be done after planting in the section or cell is completed. However, no planted area is to be left exposed without interior lines at the end of any workday. These interior lines are to prevent Canada geese and ducks from flying down into the planting area and

devouring the newly planted salt marsh grasses.

Pieces of mylar flagging shall be tied at four (4) foot intervals along the interior lines as shown on the contract drawings. Flagging must be wrapped twice around line before knotting to prevent slipping. Mylar flagging shall also be tied at the same interval of four (4) feet apart along the top strands of coir twine in order to discourage entry by birds from the air.

There shall be no unused strands of coir twine, orange safety fencing, packaging materials, mylar flagging, wood stakes or any other construction debris left on site after fence installation and maintenance.

### 3.2 MAINTENANCE

During the 1-year warranty period or the period of time needed for the salt marsh vegetation to reach a sufficient level of establishment, the fence posts, line, and mylar flags shall be routinely inspected and all damaged areas repaired immediately as necessary. In particular, the orange safety fencing shall be maintained such that geese cannot trample the fence or walk into the planting area under the fence. At the conclusion of the one year warranty period the fencing shall be inspected by the contracting officer and repairs should be made as necessary. Replaced/repaired material shall be given a six (6) month guarantee, beginning at the time of preliminary acceptance of the replacement/repair of material. At the conclusion of the maintenance period or as otherwise directed by the Contracting Officer or the Contracting Officer's Representative, the temporary fence and any associated debris becomes the property of the Contractor and must be completely removed and disposed of off-site by the Contractor.

Loss or damage to wetland plants planted within the waterfowl barrier that results from inadequate or unsatisfactory maintenance shall be replaced at the expense of the Contractor.

-- End of Section --

SECTION 02380  
GEOGRID REINFORCEMENT

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## PART 1 GENERAL

## 1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO PP46-01 (2001) AASHTO Recommended Practice for Geosynthetic Reinforcement of the Aggregate Base Course of Flexible Pavement Structures.

American Society for Testing and Materials (ASTM)

ASTM D 1388 (1996) Standard Test Method for Stiffness of Fabrics, Option A

ASTM D 6637 (2001) Standard Test Method for Determining Tensile Properties of Geogrids by the Single or Multi-rib Tensile Method

ASTM D 4354 (1996) Practice for Sampling of Geosynthetics for Testing

ASTM D 4759 (1992) Practice for Determining the Specification Conformance of Geosynthetics

ASTM D 5818 (1995) Practice for Obtaining Samples of Geosynthetics from a Test Section for Assessment of Installation Damage

Geosynthetic Research Institute (GRI)

GRI GG2 (1987) Standard Test Method for Geogrid Junction Strength

U.S. Department of Transportation - Federal Aviation Administration (FAA)

Specification for Geogrid Reinforced Base Courses, Engineering Brief No. 49 (1994).

U.S. Army Corps of Engineers (U.S. CoE)

1. Draft specification for Grid Aperture Stability by In-Plane Rotation
2. CW-02215 Determination of Percent Open Area.

Dr. Thomas C. Kinney, P.E.

1. Determining the Aperture Stability Modulus of a Geogrid (2001).

## 1.2 DEFINITIONS

- A. Geogrid - A biaxial polymeric grid formed by a regular network of integrally connected tensile elements with apertures of sufficient size to allow interlocking with surrounding soil, rock, or earth to function primarily as reinforcement.
- B. Multi-Layer Geogrid - A geogrid product consisting of multiple layers of grid which are not integrally connected throughout.
- C. Woven Geogrid - A geogrid product formed by weaving discrete strips of polymer into a network. these geogrids usually require a protective coating to protect the polymer from pre-mature degradation.
- D. Welded Strip geogrid - A geogrid product formed by heat bonding (welding) discrete strips of polymer into a regular network.
- E. Minimum Average Roll Value (MARV) - Value based on testing and determined in accordance with ASTM D4759-92.
- F. Traffic Benefit Ratio (TBR) (also known as Traffic Improvement Factor or TIF) - A ratio comparing the performance of a pavement cross-section with a geogrid-reinforced base course to a similar cross-section without geogrid reinforcement, based on the number of cycles to failure, with failure defined as a selected depth of rut.
- G. True Initial Modulus in Use - The ratio of tensile strength to corresponding zero strain. The tensile strength is measured via ASTM D6637 at a strain rate of 10 percent per minute. Values shown are MARVs. For multi-layer geogrid products, rib tensile testing shall be performed on the multi-layer configurations, as prescribed by ASTM D6637.
- H. Junction Strength - Breaking tensile strength of junctions when tested in accordance with GRI-GG2 as modified by AASHTO Standard Specification for Highway Bridges, 1997 Interim, using a single rib having the greater of 3 junctions or 8 inches and tested at a strain rate of 10 percent per minute based on this gauge length. Values shown are minimum average roll values. For multi-layer geogrid products, junction strength testing shall be performed across junctions from each layer of grid individually, and results shall not be assumed as additive from single layers to multiple layers.
- I. Flexural Stiffness (also known as Flexural Rigidity) - Resistance to bending force measured via ASTM D1388-96, Option A, using specimen dimensions of 864 millimeters in length by 1 aperture in width. Values shown are MARVs. For multi-layer geogrid products, flexural stiffness testing shall be performed directly on the multi-layer configuration without using any connecting elements other than those used continuously throughout the actual product, and results shall not be assumed as additive from testing performed on a single layer of the multi-layer product.
- J. Aperture Stability Modulus (also known as Torsional Rigidity or Torsional Stiffness) - Resistance to in-plane rotational movement measured by applying a 20 kg-cm moment to the central junction of a 9-inch by 9-inch specimen restrained at its perimeter. Values shown are MARVs. For multi-layer geogrid products, torsional stiffness testing shall be performed on each layer of grid individually, and results shall not be assumed as additive from single layers to multiple layers.
- K. Subgrade Improvement - Placement of a geogrid immediately over a soft subgrade soil in order to improve the bearing capacity and mitigate



deformation of the subgrade soil. The goal of this application may be to reduce undercut requirements, improve construction efficiency, reduce the amount of aggregate subbase/base material required, provide a stiff working platform for pavement construction, or combination of these.

L. Base Reinforcement - Placement of a geogrid beneath or within the aggregate base course of a flexible pavement system to improve the stiffness of the system. The goal of this application may be to reduce the amount of aggregate base material required (reducing initial cost), increase the life of the pavement (reduce life-cycle cost), or a combination of the two.

### 1.3 MEASUREMENT AND PAYMENT

Payment for Geogrid Reinforcement shall be made under Payment Item Numbers 0004A and 0004B, which are described in Section 01570 WORKSITE ACCESS AND EQUIPMENT STAGING AREA.

### 1.4 SUBMITTALS

The Contractor shall furnish the Contracting Officer and/or the Contracting Officer's Representative with the following:

1. Submit geogrid product sample approximately 4 inches by 7 inches or larger.
2. Submit geogrid product data sheet and certification from the Manufacturer that the geogrid product supplied meets the requirements of sub-part 2.02A of this Section.
3. Submit Manufacturer's installation instructions and general recommendations.

For Alternate geogrid Materials not meeting the requirements of sub-part 2.2 of this Section, submit the following at least 15 days prior to bid letting.

1. Full-scale (in accordance with Section 1.04A.2) laboratory and in-ground testing of pavement structures reinforced with the specific geogrid that quantifies TBR of the geogrid to the pavement structure. The TBR must meet or exceed that of the design geogrid.
2. Independent certified test results stating that the alternate geogrid exhibits an aperture stability modulus at 20cm-kg, when testing in accordance with the "Grid Aperture Stability In-Plane Rotation" test of 3.2 cm-kg/deg (for Type 1) or 6.5 cm-kg/deg (for Type 2).
3. A list of 5 comparable projects that are similar in terms of size and application, are located in the United States, and where the results of using the specific alternate geogrid material can be verified after a minimum of 1 year of service life.
4. A sample approximately 4 inches by 7 inches or larger of the alternate geogrid material and certified specification sheets.
5. Recommended installation instructions.
6. Additional information as requested by the Contracting Officer's Representative to fully evaluate the product.

### 1.5 QUALITY ASSURANCE

A. Pre-Construction Conference - Prior to the installation of the geogrid, the Contractor shall arrange a meeting at the site with the geogrid material supplier and, where applicable, the geogrid installer. The Contract Officer and the Contracting Officer's Representative shall be notified at least 3 days in advance of the time of the meeting. A representative of the geogrid supplier shall be available on an "as needed" basis during construction.

## 1.6 DELIVERY, STORAGE, AND HANDLING

### 1.6.1 Storage and Protection

The Contractor shall prevent excessive mud, wet concrete, epoxy, or other deleterious materials from coming in contact with and affixing to the geogrid materials. Geogrid material shall be stored at temperatures above -20 degrees F (-29 degrees C). Rolled materials may be laid flat or stood on end. Geogrid materials should not be left directly exposed to sunlight for a period longer than recommended by the manufacturer.

## PART 2 PRODUCTS

### 2.1 MATERIALS

The geogrid shall be integrally formed and deployed as a single layer having the following characteristics (i.e., Tensar Corporation Geogrids for Soil Reinforcement, or approved equal) ALL VALUES ARE MINIMUM AVERAGE ROLL VALUES UNLESS A RANGE OR CHARACTERISTIC IS INDICATED:

Property	Test Method	Units	Type 1	Type 2
Aperture Stability Modulus at 20 cm-kg	Kinney - 01	cm-kg/deg	3.2	6.5
Rib Shape	Observation	N/A	Rectangular or Square	Rectangular or Square
Rib Thickness	Calipered	in (mm)	0.03 (0.76)	0.05 (1.27)
Nominal Aperture Size	I.D. Calipered	in (mm)	1.0 (25) to 1.5 (33)	1.0 (25) to 1.5 (33)
Junction Efficiency	GRI-GG2-87	%	93	93
Flexural Rigidity	ASTM D1388-96	mg-cm	250,000	750,000
Minimum True Initial Modulus in Use	ASTM D6637-01			
- MD		lb/ft	17,140	27,420
		(kN/m)	(250)	(410)
- CMD		lb/ft	27,420	44,550
		(kN/m)	(400)	(620)

#### 2.1.1 Alternate Structural Soil Reinforcement Materials

Alternate structural soil reinforcement materials will be considered in accordance with the following conditions:

1. Alternate geogrid materials shall not be used unless submitted to the Contracting Officer's Representative and pre-approved in writing by the Contracting Officer's Representative. In order to be considered, submittal packages for alternate geogrid materials must be prepared and submitted in accordance with sub-part 1.05D of this Section.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

The Contractor shall check the geogrid upon delivery to verify that the proper material has been received. The geogrid shall be inspected by the Contractor to be free of flaws or damage occurring during manufacturing, shipping, or handling.

#### 3.2 PREPARATION

The subgrade soil shall be prepared as indicated on the construction drawings or as directed by the Contracting Officer's Representative [refer to sheet CP-1 and TD-2].

#### 3.3 INSTALLATION

Unless otherwise directed by the Contracting Officer's Representative, the geogrid shall be installed as follows:

- 1) The geogrid shall be laid at the proper elevation and alignment as shown on the construction drawings.
- 2) The geogrid shall be installed in accordance with the installation guidelines provided by the manufacturer or as directed by the Contracting Officer's Representative.
- 3) The geogrid may be temporarily secured in place with ties, staples, pins, sand bags or backfill as required by fill properties, fill placement procedures or weather conditions or as directed by the Contracting Officer's Representative.

#### 3.4 GRANULAR FILL PLACEMENT OVER GEOGRID

Granular fill (aggregate) material shall be placed in lifts and compacted as directed by the Contracting Officer's Representative. Granular fill material shall be placed, spread, and compacted in such a manner that minimizes the development of wrinkles in the geogrid and/or movement of the geogrid.

A minimum loose fill thickness of 6 inches is required prior to operation of tracked vehicles over the geogrid. Turning of tracked vehicles should be kept to a minimum to prevent tracks from displacing the fill and damaging the geogrid. Rubber-tired equipment may pass over the geogrid reinforcement at slow speeds (less than 10 mph) when integrally-formed geogrids are used. When woven, multi-layer or welded-strip geogrids are used, rubber-tired equipment shall not be allowed directly on the geogrid. Sudden braking and sharp turning movements shall be avoided.

#### 3.5 INSPECTION

The Contracting Officer's Representative may randomly inspect geogrid before, during and after (using test pits) installation. Any damaged or defective (i.e. frayed coating, separated junctions, separated layers, tears, etc.) will be repaired/replaced in accordance with section 3.6

### 3.6 REPAIR

Any roll of geogrid damaged before, during and after installation shall be replaced by the Contractor at no additional cost to the Corps. Proper replacement shall consist of replacing the affected area + 3ft (1m) of geogrid to either side of the affected area.

### 3.7 PROTECTION

The Contractor shall follow the Manufacturer's recommendations regarding protection from exposure to sunlight.

END OF SECTION